

**COOP'S
SATELLITE
DIGEST**



DECEMBER 1982

APOLLOTM ZX

Satellite TV Systems

...You can't stay home without us.



Before you buy ANY satellite system, ask these important questions.

- 1** Does the system utilize an LNC or an old fashioned LNA?

The new Apollo LNC (low noise converter) eliminates the need for cumbersome 4 GHz cable and moisture-sensitive downconverters. Easier installation, greater reliability, and reduction of moisture problems all make good sense to National Microtech.



- 2** Does the receiver change polarity by instantaneous electronic switching or by mechanized movement that may fail due to ice or sand?

Microtech's new Apollorizer changes the polarity electronically with no moving parts. While rotors and rotating probes may be vulnerable to ice and sand, the Apollorizer is at home in any environment.



- 3** Does the receiver allow you to move your outside antenna by remote control?

The Apollo Z-1 receiver (tuner) changes video, audio, polarity, and position of the antenna...all from one control console.

- 4** Is the antenna reflector impervious to rust and corrosion—or is it a wire mesh that may be here today and rusted out tomorrow.

The Apollo X-10, the best performer we have seen in a 3-meter dish, is made of thermo-compressed fiberglass—and Microtech guarantees a perfect match on all 8 panels. Corrosion & rust affecting wire mesh antennas are not factors in the performance or longevity of the X-10 reflector.

The price of an Apollo system is unbelievably low...STARTING AT LESS THAN \$3000 RETAIL.

Your dealer may have financing available. And, chances are, he can even install your system tomorrow.

NATIONAL MICROTECH SUPPLIES MORE SATELLITE TV SYSTEMS THAN ANY OTHER COMPANY IN THE WORLD.



We are proud of our company and products, and of the fantastic job our dealers and distributors across the country have done in selling and installing Apollo equipment. When you see our new line of Apollo systems, you will understand why few companies have experienced our phenomenal growth and success. Apollo TV... you can't stay home without us.

Dealerships and distributorships available in some areas.



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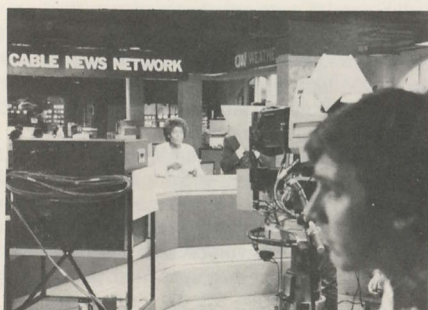
National Microtech, Inc. / P.O. Drawer E / Grenada, MS 38901

TOP OF THE MONTH

EUROPE. Or, outside-of-North America, in particular. There is plenty of 'text' concerning satellite system development beyond the North American shores in this issue of **CSD**. And for good reason.

WE judge that the lid is about to blow off the European (African/Middle Eastern) TVRO scene. And anyone who manufactures, distributes or deals in TVRO systems will have the opportunity to 'cash in' on this tremendous explosion. Our job is to give you plenty of advance warning about new markets for TVROs, and to that end we are leaning on some reports and analysis of off-shore activities to get you as complete a picture as possible in this issue.

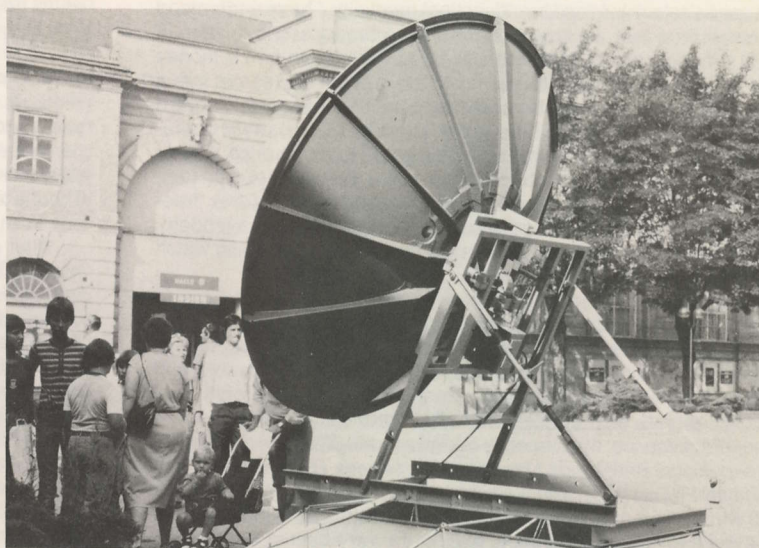
NOT content to sift through written and telephoned reports, Coop packed up the family and visited Europe for two weeks in late September. His first hand observations appear in the 'Comments' section of this issue.



ATLANTA. It happened. Boy, did it happen! This was probably the most gratifying show, the most productive show, in the nine show series staged by STT(I) to date. And we have a full report, **also**, in this issue.

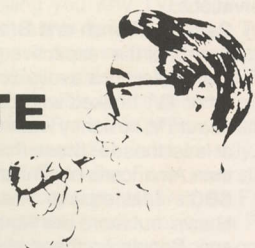
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OUR COVER — On display at the Unispace '82 exhibit in Vienna, Austria, this Russian **MOSKVA TVRO** terminal is designed for direct connection with the G(h)orizont bird at 14 west. These under 3 meter terminals are usually connected to low and medium power terrestrial transmitters operated by remote (satellite) control. **Above** — rear of antenna showing elevation adjustment hand driven jack screws. Azimuth is apparently fixed on this model. Photos courtesy of **Theo Pirard**, Centre d'Information Spatiale, Pepinster, Belgium.

COOP'S SATELLITE DIGEST



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COOP'S SATELLITE COMMENT

- EUROPE/
Here We Come, Ready . . . or Not!
- BIRKILL'S FIRST BOOK
- SERIOUS EQUIPMENT EVALUATION

WHY EUROPE?

I have never fully appreciated, and possibly little understood, the 'European' television (and broadcasting) mentality. I **have** understood for some time that we have a very unique broadcasting system in North America, where individuals like Ted Turner can turn a money losing UHF independent television station in Atlanta, Georgia into a showcase for international broadcasting. And because we have had a constant stream of visitors here to our Turks and Caicos WIV operation, many from areas of the world far from North America, I have many opportunities to talk about broadcasting philosophies with people who probably have as much trouble understanding the 'free-wheeling' / 'anything goes' system as I have accepting that a modern, advanced country such as Germany only allows its citizens to watch two or three channels of television.

And, because this small country where the family and I reside happens to be tied to the United Kingdom (Great Britain), we have a fair number of people here who have come from the UK (recently, or originally) and I get more than a little peeved when I am told that 'English television is far better than American television.' The UK, until this past month, also only allowed citizens to select between three channels of service; they recently added a fourth. We all of course see the occasional British video feature, 'Masterpiece Theater' from PBS, or 'Benny Hill' on WOR and a whole list of BBC/ITV programs over on TR8 of F4. Some of what we see is good, but then I have always believed that we were probably getting the very best of British television since there is little export market for the less wildly acclaimed stuff.

Into this confusing muddle I have closely followed the **promises** of satellite television coming to Europe. And that, plainly, has had me exceedingly confused since the very concept of 'open skies,' of the free exchange of television programming across national borders, flies in the very face of what is traditional about European television. Confused about it all, not certain how much European satellite television could possibly amount to given my basic understanding of European terrestrial television, Susan, Tasha, Kevin and I packed four small hand carry bags and hopped onto a Pan American flight from Miami to Frankfurt, Germany in the middle of September. As much as we travel within North America, this was a first for us. Before leaving the states we purchased a wonderful plastic card called 'Eurorail Pass.' For 15 days we could ride virtually any European train we wished, when we wished, 'first class.' For those who think that sounds like a bum deal, because of the sad state of Amtrak and private American trains, be advised that the European rail system is magnificent. You can go virtually anyplace, virtually anytime you wish, in comfort, relative speed, and really see what the continent looks like from the ground. I would go back to Europe just to travel on Eurorail; it is that nice.

We had no reservations except for the airplane. We planned to land in Germany and having been thoroughly indoctrinated by Tom Humphries and others on the wonders of Germany climb aboard a train and head south to Heidelberg; about an hour by train from Frankfurt.

A 9 to 10 hour flight on a DC-10 is not a pleasant experience. We left Miami around 7 PM Miami time and arrived in Germany after 10 AM local time. Essentially you go a night without sleep. The sun

comes up in September just before you reach the western coast of Ireland; although at 35,000 feet it might as well be Cape Cod. Delighted to be free of the DC-10 'tomb' we stumbled onto German soil clutching our passports and looking for the first currency exchange office.

Almost anyplace you go in Europe you find currency exchange windows. They take your dollars or Lira or Swiss Francs and they give you back a like amount in the local currency, less a fraction of a percent exchange fee. It is important you do this **promptly** because you can't buy a newspaper (the English language International Herald Tribune is widely available), hire a cab, get something to eat or use a pay toilet unless you have the local currency.

After getting a handful of Deutsch Marks, we followed the crowd heading for the plainly marked stairway leading to the underground train station below the airport. We kept our eyes peeled for customs, or immigration, since at this point we had managed to walk from the airplane through a huge airport, and we had encountered **nobody** that wanted to know who we were and how we got there. Moments later, standing on the train station landing, trying to figure out which train would take us into the main Bonhof (train station) where we would change for Heidelberg, we became concerned.

Whenever we come back to the states into **Miami**, we **know** that we will stand in line for up to three hours while the custom's people deal one on one with the thousands of people ahead of us. Then we'll stand in a second line for up to an hour to let some clown paw through our bags looking for contraband. And everyone **knows** that in Europe they have terrorists and other nasty people, and we expected no less of a grilling.

Several days later, now in France having trained our way from Germany to Leichenstein, Switzerland, Italy and France, we would finally meet our **first** immigration person. Thirteen days after we left Miami, we would set back down there with only two immigration 'stamps' in our passports; one French, given matter of factly while we were speeding on a train into Belgium, and the other inked into the passports in the UK as we were preparing to leave Heathrow airport. I mention this because I had a misconception about the 'hassle' one gets in Europe as a 'foreign' traveler, and I suspect others may have expected the same. Not to worry. Just take the train and you'll never have any problems!

I could waste a great deal of valuable **CSD** space giving you my impressions of European television. I'll shorten it up with these observations:

- 1) German, French and British TV has been so firmly under the control of the respective governments that the handful of program selections available in each country largely turns people off of TV. I talked with dozens (perhaps hundreds) of people about TV, how they watch it, what they feel about it. Europeans, at least those in **these** three countries, watch far less television than Americans of similar age groups. Programs similar to the BBC's 'Masterpiece Theater' abound. There are lots of talk shows, but more like Norman Vincent Peale than Johnny Carson. People on these shows talk 'at' you, not 'to' you or with you. They remind me of PBS ten years ago.

Young people, especially in Germany and to some extent in France, watch virtually no TV. 'Young' in this context is anyone under

30. As I approach 45 everything about age changes perspective.
- 2) Swiss, Italian and Belgian TV viewers are different. I suspect Dutch viewers would fall into this lot but we did not visit there. Swiss and Belgian viewers have cable TV. Lots of cable TV. Swiss viewers watch France, Italy, Germany, Austria and, via Satellite, a British service. As well as their own local service. Belgian viewers watch a wide variety including German, French, Dutch and some English stuff; in addition to their own, again.

Many people speak three or more languages and German youth, for example, have to take **two** foreign languages and they are encouraged to take a third. We had a delightful taxi driver in Heidelberg who had studied English 11 years. It shows, where cable has penetrated (Belgium, Switzerland), because viewers seem equally at home with their own native service or one piped in from across a border.

The Italians live in a world all of their own. A couple of years ago the Italian government took the lid off of television licenses and allowed almost anyone who could pay for a station to build it and operate it. We only went into northern Italy (Milan) but the average house or apartment there had between five and eight separate TV antennas on the roof (talk about cramming a bunch of aluminum onto a ten foot mast!). All pointing in different directions. Italian TV is bold, assertive, and often very unprofessional. But the youth of Italy like television, expect something from it, and talk about it. My 'interviews' in Germany produced the opposite reaction ("I **watch television**. Let me see, last month, no it was the month before, I watched a soccer match . . .").

Now let me try to put this into perspective.

Americans and Canadians (and those from the Caribbean and Central/South America) were ready for satellite TV. Why? Because people **knew** that TV could be their window on the world. **We all grew up knowing** that we could turn on a **radio** and find dozens of **different** program formats available. We knew that the bigger cities had TV that worked the same way. We didn't have to be 'sold' on the concept of 'virtually unlimited choice.'

This whole concept of unlimited choice of entertainment, education, and news is totally unknown in Europe. Even in Belgium, Holland and Switzerland where cable TV thrives and **channel choice** is reasonable, **program choice is not**. Why?

Well, when you have no more than four (England) and as few as two (many countries) channels to select from, and those channels are directly or indirectly run by the national government, the 'freedom' to innovate disappears. Television is very visible, very attractive to criticize, and always in danger of being used overtly or subtly for political manipulation.

I detected in Germany a general sense among the 'youth' that television was not even a marginal part of their lives. When there were sets running in public places (and they abound), the crowds (if there were crowds) watching were primarily over 50, quiet, and absorbed in the dramas. My Germany observations hold for Switzerland as well, although cable TV is a status symbol in the larger cities (Bern, Zurich areas) and an absolute necessity in the smaller towns usually buried at the bottom of deep Alpine caverns.

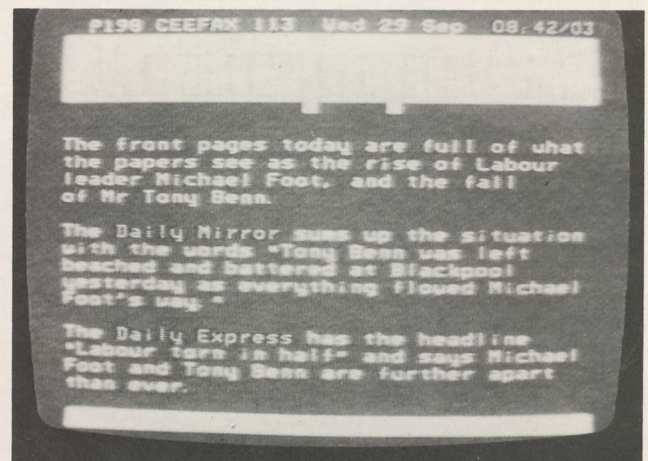
The French marketplace is so 'protectionist' minded that I could carry on for pages telling you why TVROs will never amount to much in France; not in **this** decade anyhow. To put it simply, the French government does not want **any** outside influences reaching the people, wants as little non-French product in the marketplace as possible, and they run the television system as if television was a French invention. France, to this tourist family, was the least cordial, least friendly, least eager to please country of all. Even the Paris train stations refused to post signs in any language **other than** French, provided no assistance to anyone who did not speak French and manned their 'information booths' for arranging ongoing train reservations with people who pretended not to speak English. I wouldn't waste any time thinking about France, if I were you. Except how to avoid going there.



Belgium, which I suspect is similar in many ways to Holland, is quite an international place. The only thing that disappointed me about Belgium was the filth. And the poor physical condition of its people. I think most of them are carrying around 30-50 pounds of extra weight. The areas we visited were upbeat, progressive and ready for what the world had to offer. This is a two language or three language country; French, Dutch and German. Most people also speak English as well and their proliferation of cable TV accounts for some of this. Unlike France, they are not worried about importing foreign television service, or allowing their people to share neighboring country ideas. I think Belgium will be a good marketplace for TVROs.

England is a question mark. I say this because of the surprising (to me) state of the English economy. With two BBC television channels, and (now) two independent television channels, there **is** a reasonable selection of television. What is missing in England is a strong economy, and, a reluctance of most English folks to learn a second language. If you are going to sell TVROs in the UK on a wide scale, you are going to have to supply English language television on the bird(s).

Being a student of what makes people use television, I visited with as many people as I could in the 'video' business. I was surprised to find that in Germany, and Switzerland, and Belgium, 'sex' is a three letter word that is used to spell VCR. In Germany, in particular, 'Sex Shops' are about a block or two apart all over the larger cities. Inside, you find the greatest selection of 'X' and 'XXX' videotapes you can imagine. VCR machine rental is a big thing virtually all over Europe (France being the usual exception) and 'sex films' on videotape are far more popular than they are in North America. I must confess that I was a little embarrassed by this pre-occupation with things



ATLANTA/ BIGGEST, BEST YET?

The Atlanta STTI 'Satellite International Business Conference' is over but hardly forgotten. Virtually everyone attending agrees that this was 'the best,' the most 'upbeat,' and the most 'sales oriented' trade show in the young history of the industry.

Numbers. There were 141 booths. That's a 30% or so increase from the last STTI trade show, held in Fort Worth last March.

Numbers. The main lecture hall had 840 hotel provided chairs. Many of the Friday and Saturday sessions were filled and up to 200 people could be spotted standing in an overflow situation. A total attendance in the 2,000 plus range seems reasonable although no 'official count' has been released.

Numbers. In the antenna department, there was a sudden explo-

sion of antennas in the 8 foot size region. Of the 70 plus antennas in the antenna parking lot, at least eight were 8 foot in size. There was one six foot terminal antenna package as well. We'll talk about both shortly.

Numbers. A number of new products recorded phenomenal introductory session sales records. Or, at least those who brought the products to the show claimed some outstanding numbers. At least two manufacturers (Hoosier Electronics, Intersat) reported that new antennas they introduced at Atlanta sold in excess of 4,000 units each; from on-floor, show generated orders.

Numbers. A new receiver from Swedish based Luxor Communications sold out through planned February deliveries within hours of the show's opening. The receiver importer, Jim Rothbarth's Satellite Technology Services, reported all 2,000 receiver units scheduled for delivery into the states by February were 'spoken for.' Many of the regional distributors were placed on an allocation program for the first few months, and they were less than pleased that the receiver had proved so popular so quickly. Rothbarth, naturally, was delighted.

Numbers. More than one feed per parabolic antenna attracted a great deal of attention. The SMATV folks in particular were delighted to see that the antenna designers had worked out techniques so that a single reflector could be used to bring down simultaneous signals from up to five separate satellites, spaced at 4 degree intervals. We'll have more to say about that also.

The Atlanta show as the first opportunity for the newly elected SPACE Board of Directors to meet, and to wrestle with the ongoing legal, legislative and 'public image' problems of the young industry. The new Board has 21 members including specifically designated representatives from both the SMATV portion of the industry and the dealer portion of the industry. The 'expansion' of the Board to 21



THE ANTENNA LOT / 48 hours before the show opened.

members came at a time when the industry needed to react to the growth of the dealer and SMATV activity areas if it was going to continue to grow as a cohesive unit. During the SPACE Atlanta Board meeting, new officers were elected for 1982/83. **Bud Ross** of Bird-view, Inc. was selected as the new trade association Chairman, **Bob Behar** of Hero Communications was selected as the new President, **Horton Townes** of National Microtech was elected as Treasurer while **Andy Hatfield** of AVCOM of Virginia is the new Secretary.

The SPACE Board also approved a plan for the trade association to conduct an SMATV (Private Cable) one day seminar event this coming January in Las Vegas, just before, during or immediately after the Consumer Electronic Show (CES). Another 'show decision' established mid to late October of 1983 (and 1984) as the 'official window' during which the next (and subsequent) annual SPACE trade show and convention would be held. For 1983, a total of six cities was selected for 'close study' and a committee formed to develop an early report on which of the six suggested cities could accommodate the group. Preliminary indications, since the show, point towards either San Antonio (TX) or Orlando (FL) as the site for the 1983 gathering. The financial success of the 1982 show (Omaha) was a much needed and welcome source for trade association revenue; but the strains that preparing and running the show placed on the General Counsel's office were obvious. The SPACE show committee is also investigating contracting with an outside show organizer to package the 1983 event.

New concerns that some municipalities are already adopting legislation that seeks to limit the size of home TVRO system antennas, or in two cases, actually deny the installation of TVRO terminals, surfaced. Hollywood (FL) and Carmel (CA) have apparently recently adopted municipal 'zoning regulations' which will prevent future in-

stallation of terminals within their boundaries. One or both are going to be challenged in the courts, of course. What appears to be happening here is that aggressive, local, **cable firms** are talking their city fathers into adopting zoning regulations that will insure that private TVROs do not become available in their marketplaces. The cable firms, of course, seek to limit any competition and keeping private TVROs out seems like a good place to start, to them!

Following closely on the announced agreement that SPACE has negotiated an agreement with SelecTV for motel and hotel use of Selec's premium movie service, the Board heard of a similar agreement which was just being wrapped up with **ESPN** for motel and hotel use of the all sports, 24 hour per day service. It appears that motel and hotel (and apartment) systems that elect to carry ESPN will be charged around 5 cents per outlet per month if the ESPN service is made available to all sets connected to the system (i.e. as a part of 'basic' service), 50 cents per outlet if the ESPN service is re-sold as a part of a pay (i.e. 'premium') level of service. There will be some restrictions relating to blacking out occasional events in certain areas where professional sporting league contracts conflict with local satellite delivered program distribution patterns.

The Atlanta show made it clear that the 'distribution patterns' of the industry's hardware has matured a great deal during the last 12 months. Echosphere's Candy McAdam and National Microtech's Dave Fedric appeared on the Friday early morning television show with Coop to discuss how those changes are causing the distributors to re-think the equipment 'pipeline network' operation. For example, most agree that as we close out 1982 there are three different **levels** of distribution happening in the marketplace. One level is represented by Hoosier Electronics, and National Microtech. Both firms move very large quantities of hardware (although not with the same approach to hardware selection) through closely affiliated dealers. The volume of



THE ANTENNA LOT / 42 hours before the show opened.

the hardware they move is a major portion of the hardware moving in the industry these days. A second level is represented primarily by just a single distributor operation; Long's Electronics of Alabama. Until recently, virtually all of the hardware moved by Long's has been in a region close to their (Birmingham) Alabama headquarters. However, Long's "share of market" in that region has been phenomenally high (some suggest well over 70%) and that has made Jim Long a major force to be dealt with.

The third 'level' that has emerged as a strong force is made up of around 12 'regional' distributors who have done some national selling, but who largely handle sales regions within 400 to 700 miles of their headquarters. **Individually** those 12 firms do not have the clout of say a Long's or a Hoosier. But collectively they represent a combined market that could account for 30% of more of the national market. Out of the Atlanta meeting may come some close future working relationships between those 12 or so firms, and **perhaps** during 1983 the growth of that 'close working association' may have a major impact upon the way product is distributed in the year ahead.

Chain stores are ready to pop. It is no secret that firms such as Intersat have been working with major retailers such as Western Auto for several months now. Or that Boman Industries has been working on a program with national retailer Wal Mart. In Atlanta it became apparent that the growth of national 'chain store accounts' was going to be big (very big) during 1983. Dozens of well known, quickly recognized chain store firms not only had buying and marketing representatives in Atlanta, but they were putting the finishing touches on hardware packages with both major manufacturers as well as major distributors of packaged systems.

Clearly some of the smaller dealers are worried about how this

chain store growth might impact on them. It is one thing for a small dealer to be competing head to head with other area dealers for the consumer's dollar. It is frightening some to contemplate competing against national chains that offer discounted package prices as well as some form of long term financing.

National's Fedric identified a lack of universal, national consumer financing as a major impediment to healthy growth during 1983. Several firms are working very hard to get universal financing available on a national basis, and the recent drop in the prime rate and the general improvement in the national money market is encouraging for those working in this area.

Numbers. Nobody seems to have an **accurate** handle on the actual number of terminals shipped and delivered during calendar 82. SPACE is addressing this problem by hoping to become a national 'neutral clearing house' for individual dealer and distributor reports on a monthly basis, and then turning those individually collected numbers into national numbers and projections. One year ago it was possible to develop some reasonably accurate numbers by talking privately with key suppliers in areas such as LNAs. This year, because of the growth of LNB and LNC receiver systems, and the tremendous expansion of the size of the 'pipeline,' meaningful numbers are far more difficult to glean. The best estimates (some would call them guess-timates!) point at between 50,000 and 60,000 complete terminal 'packages' being shipped between 1 January and 31 December for 1982. How many of those are lodged in the 'pipeline' at any point in time? Perhaps 10%.

Receiver packaging, as noted with the Luxor receiver, is changing rapidly. And so is the pricing. Intersat, for example, displayed a new receiver that is a total home entertainment center; offering not



THE ANTENNA LOT / 48 hours before the show opened.

only all of the features of a modern home TVRO receiver (including remote control), but also offering a built-in 8 track, cassette, AM and FM radio package plus stereo audio and amplifiers right down to a home stereo speaker system. Boman Industries created a considerable stir with their previously announced (see **CSD** for October 1982) new receiver packages. Boman had to literally fight off repeated attempts to photograph the two new (satellite monaural, and satellite stereo) receiver system packages. They expect to be shipping the two new units during the first quarter of 1983.

Ed Grotzky of Arunta Engineering Inc., after inspecting the new Boman products, observed **"By the time this industry next meets in Las Vegas (mid March at the next STTI show) anyone that doesn't have the fantastic design appeal of the new Boman products is going to be in trouble."** The new Boman receivers price out (without down converter and optional remote control) just over \$500 for the dealer.

Pricing was another major topic throughout the entire show. We talked with dozens of dealers who had not been to a satellite industry show in a year or more, who were astounded to find the very latest super consumer oriented receivers such as the Luxor unit selling with all of the 'bells and whistles' to dealers in the \$750 and down class. One dealer told us **"I remember what an effort it was to get the first Sat-Tec and ICM receivers down under \$1000 (\$995) back at the San Jose (CA) show about two years ago. Now here we are with receivers that do everything anyone could ask, the very latest in remote control packaging, automatic antenna rotation and even satellite selection from a hand held keyboard control."**

Well, little did this chap realize that what he was seeing in the new Luxor (and other new receiver designs) at Atlanta was just the very

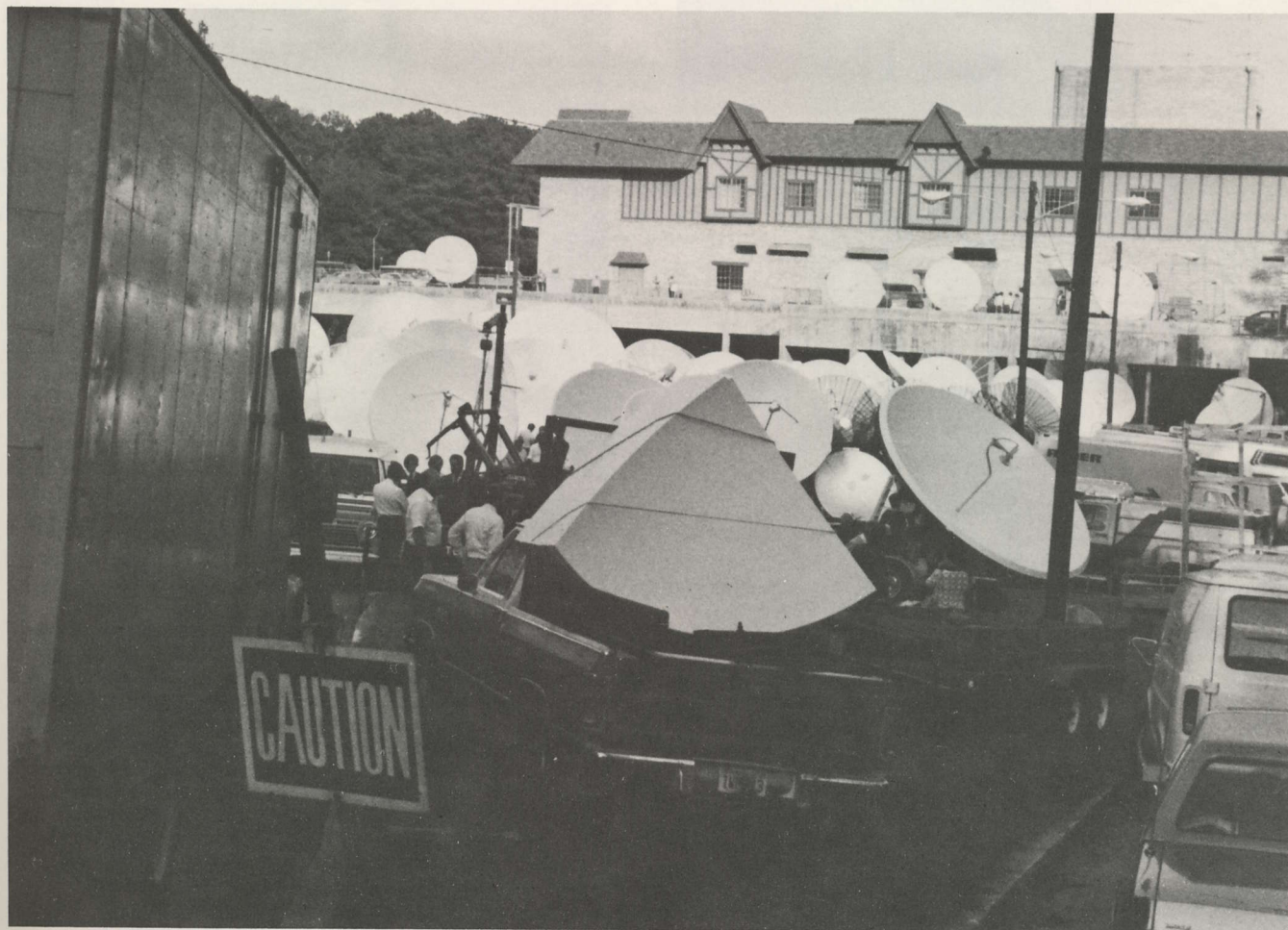
first, childlike steps towards 'smart TVRO receivers.' The buzzword we will all learn to understand, appreciate and 'run with' in 1983 is going to be the phrase 'microprocessor.' We'll visit that topic as early as our January issue.

As noted earlier, antennas got a lot of display and discussion. Taylor Howard shocked many attendees when he announced in a session that **"virtually all of the antennas in the lot are awful."** What Taylor meant was that as he walked about the antenna lot and studied the antennas on display, and operating, he saw badly distorted 'parabolic shapes.' A distorted parabolic shape is, of course, one that reduces the real world gain of the antennas. **"I feel that the quality of antennas has gone backwards, regressed, during the past year"** he added.

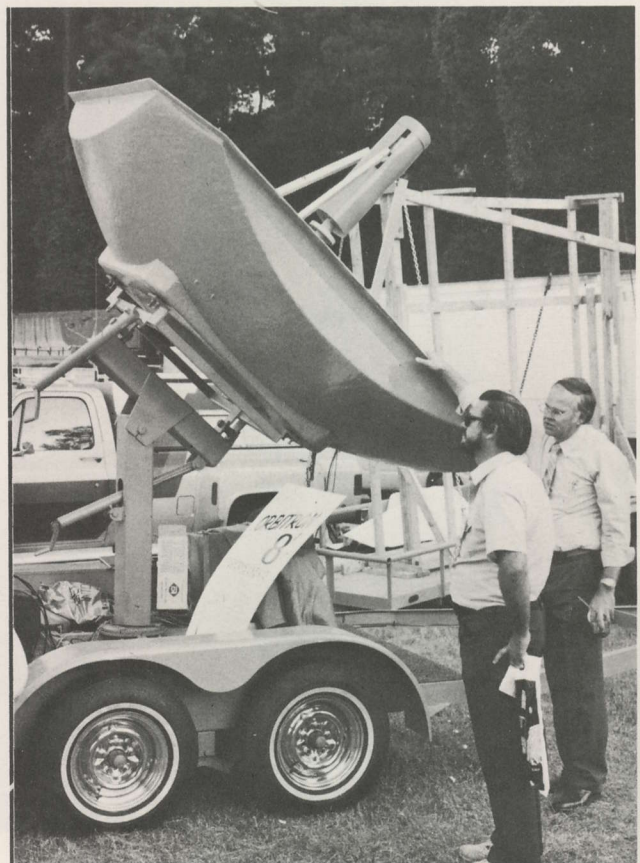
There had to be some exceptions to that rule of course since Atlanta brought out the first big showing of smaller-than-10 foot antennas. There were in particular a large selection of 8 footers including many that are manufactured by the 'spinning' process; they were both steel and aluminum. There were also high quality 8 foot fiberglass and some 8 foot mesh surface antennas. Everyone offering these antennas, and several played with exceptional picture quality and system sensitivity, was hoping to bring the total package **dealer** price down under the magic \$1995 dealer cost figure.

The Norman Gillaspie offering of a six footer home terminal package (antenna, mount, LNA, feed, cable, receiver, modulator) caught several by surprise. The suggested Gillaspie pricing on the system was \$1995 **retail**. In a 34/35 dBw and up footprint area, it was delivering excellent home grade (if not cable or studio grade) pictures.

TEXT CONTINUES / page 17



THE ANTENNA LOT / 4 hours before the show opened.





Videophile Satellite Television

The possibilities of component audio come to satellite video.

Component equipment has become popular in the audio field for a lot of reasons. One reason is that the component philosophy allows a purist to upgrade any piece of a system as technology advances without having to replace the entire system at once. This basic idea has ushered in an era of specialty firms dedicated to advancing the art of a single link in the chain. They succeed because all of their efforts are focused on one discipline, not thinly spread over an entire system. EARTH TERMINALS™ brings this philosophy to satellite television. We concentrate on the single most important, most difficult element—the microwave receiver. No other part of the system has such a dramatic effect on picture quality.

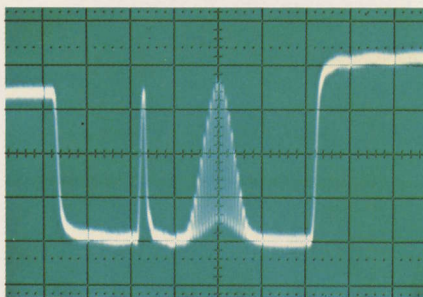
Quality You Can See

An EARTH TERMINALS receiver provides cleaner pictures with less granularity. Truer colors that don't smear. Less sparkling snow on weak programs. Complete absence of herringbones and waves. Superimposed lettering that doesn't tear at the edges. In fact, you haven't seen video this exciting unless you've been in a television studio. If you own a quality video projector, you'll be even more impressed.

Quality You Can Measure

Broadcast engineers are impressed with the accuracy of EARTH TERMINALS receivers too. Our VITS Sin² Pulse and video SNR test results are incom-

parable; actually the equal of most commercial grade receivers. We can also handle tough signals like Reuters data transmissions that give other receivers fits. It's no wonder then, that after exhaustive testing, some cable companies and television stations use EARTH TERMINALS receivers as their main source of satellite program material. They know value when they see it.



Unretouched Off-The-Air Sin² Pulse Test

It's Easy To Live With

All this technical sophistication is really quite easy to get along with. Precise automatic fine tuning tunes every channel the same way every time. You don't have to be an expert to get perfect

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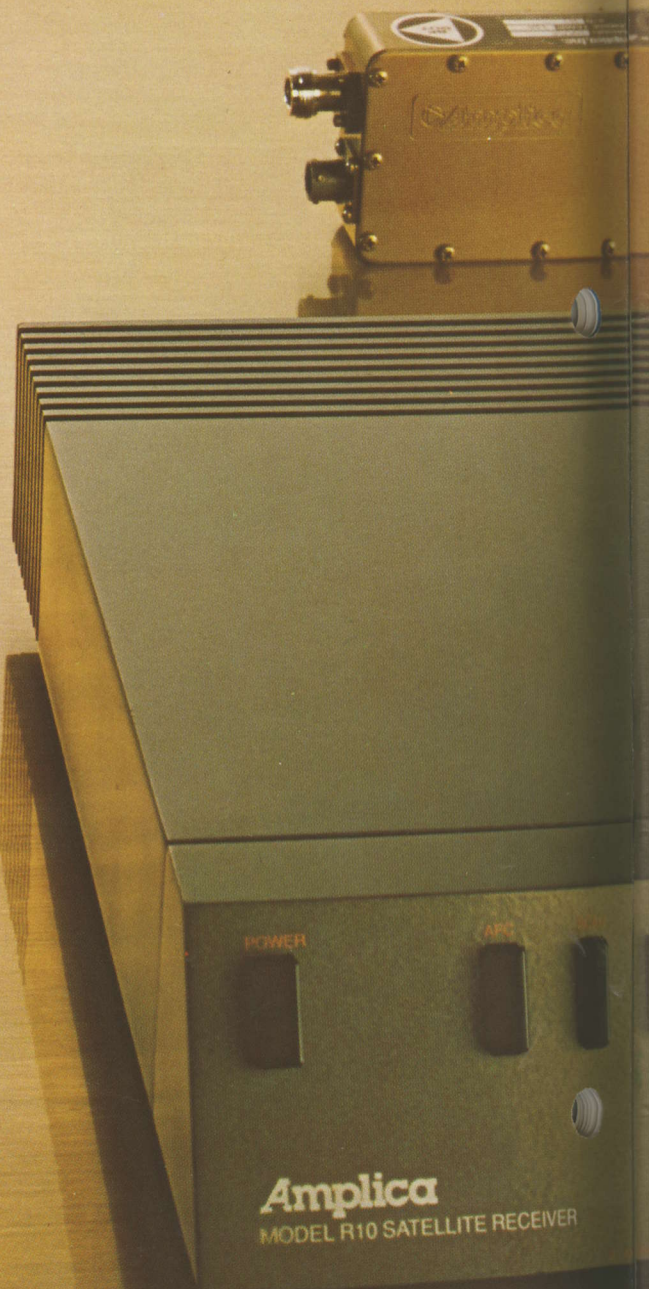
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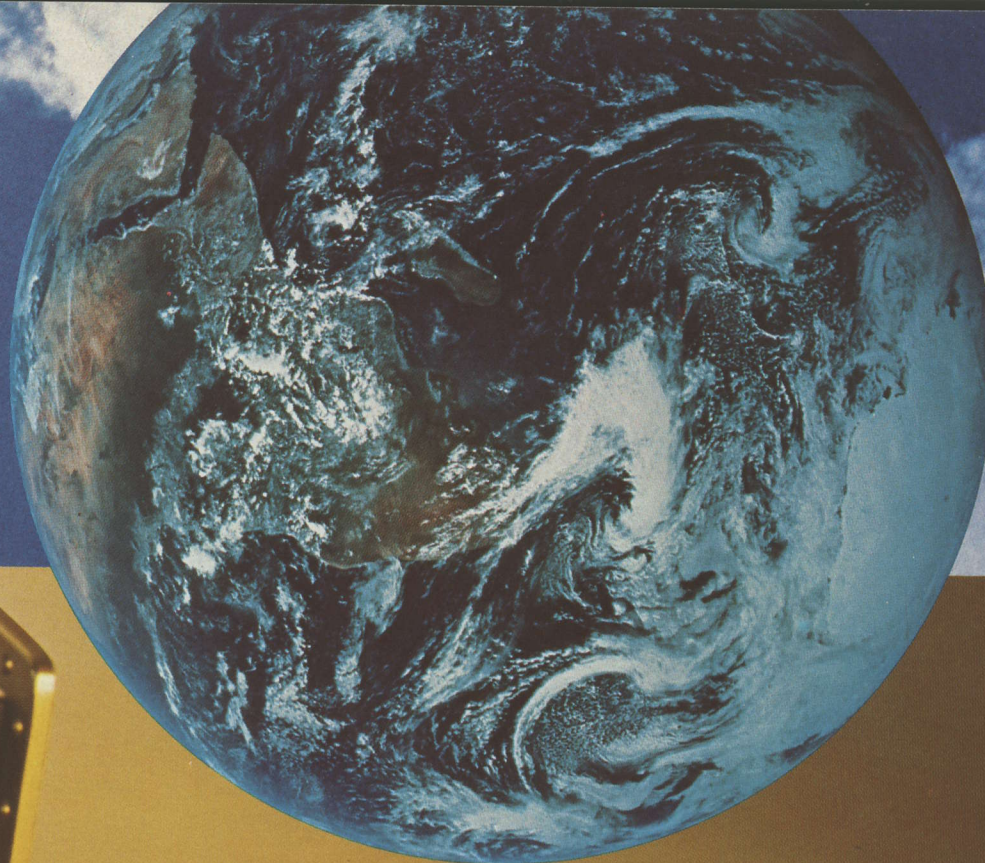
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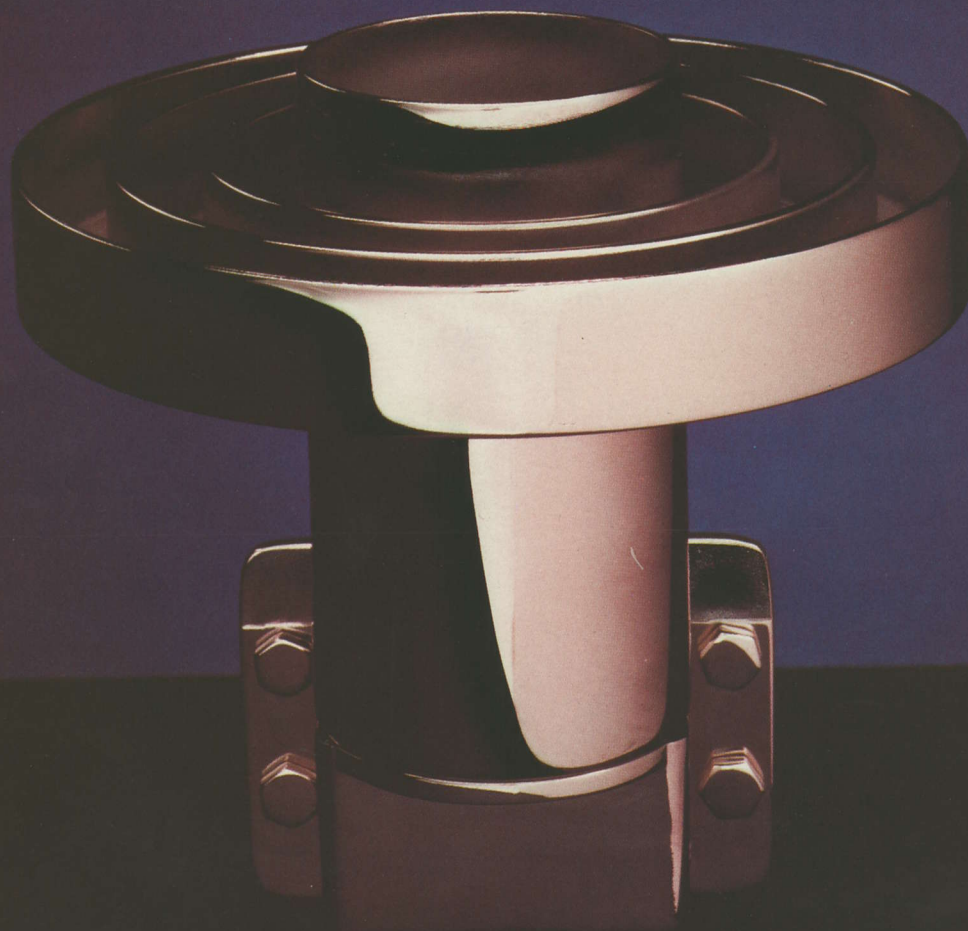
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CHAPARRAL



FIVE FEEDS AT ONCE / Lewis Larsen of L.P. Incorporated (P.O. Box 167, Pocahontas, Ark.) displayed a 16 footer with five separate feeds that brought in signals from five separate satellites without moving the dish. At a time when the cable industry is just now discovering that they can put TWO feeds on a single antenna, for two satellites spaced 4 degrees apart, it was refreshing to see a working demonstration of five feeds. Once again the home/Private Cable TVRO industry is showing the 'big boys' how it is done!

Has electronics gotten so much better that suddenly 8 (or 6) foot systems will play, and can be sold without fear of unhappy customers? Many of the suppliers evidently **believe** this is the case. The truth may be a combination of factors; not simply 'better electronics.' The Gillaspie system, for example, is sold only as a system. It is touted as a 'tuned system' and it is guaranteed for performance only when the retailer buys and sells it as a complete package. The apparent high accuracy of the six foot surface, plus the unusual and innovative feed, contributes a major part of the system performance.

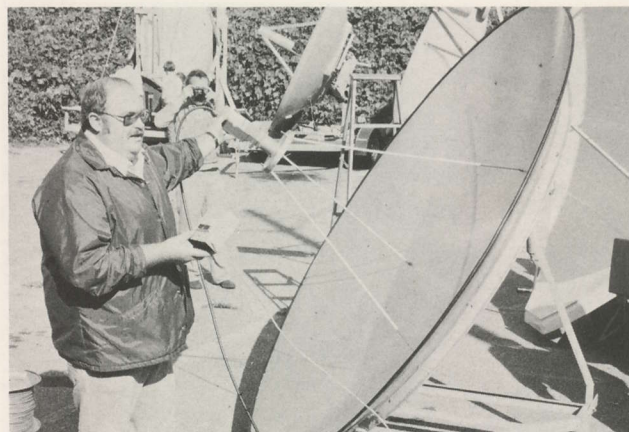
But of greater importance is the fact that during the last 8 to 10 months we have seen new, higher power SATCOM and WESTAR satellites go into operation, with footprints that are from 1 to 3 dB hotter than the earlier birds which they have replaced. If you put up to 3 dB more power **into the satellite system** in the sky, it follows that you can **take out up to 3 dB** in that portion of the system which sits on the ground; and not sacrifice system performance in the process. This also tells us that even a power increase to 20 watts per channel on the satellites would probably put us into the 4 GHz "DBS business" with antennas in the 4 foot class. **Nobody is planning 20 watts at 4 GHz soon**, but the possibility that it might happen adds yet another element into the mixture that sits out there in the form of a future **12 GHz DBS** service.

STTI's Rick Schneringer had billed the Atlanta event as an "international conference." There were, to be sure, a considerable number of people on hand from the Caribbean, central and South America,



NORMAN GILLASPIE and his six foot terminal. Norman is holding up another new Gillaspie product; a complete 4 GHz TVRO test set that includes a built-in video monitor (and audio), as well as signal measurement and system testing functions.

and even Europe. One panel session discussed how new satellites now operating for North American domestic services were finding viewers throughout at least the western hemisphere. There was some heated debate about the need for **large** antennas in the eastern Caribbean and Peter Sutro of Patmar Technologies repeatedly pointed out that high quality 10 to 13 foot antennas are delivering high quality pictures on at least the six 'hot' transponders of F3R (3, 7, 11, 15, 19 and 23) as well as a similar set of 8 to 10 channels from Westar 4. Other antenna system designers felt that it was a **mistake** to sell

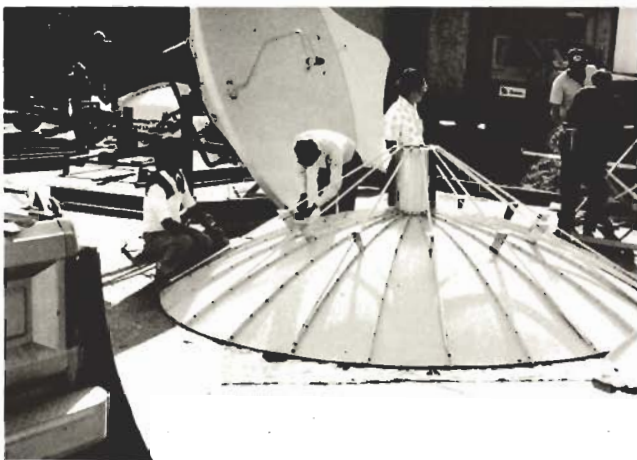


DH SATELLITE TV's 8 footer is spun metal and the pictures were excellent.

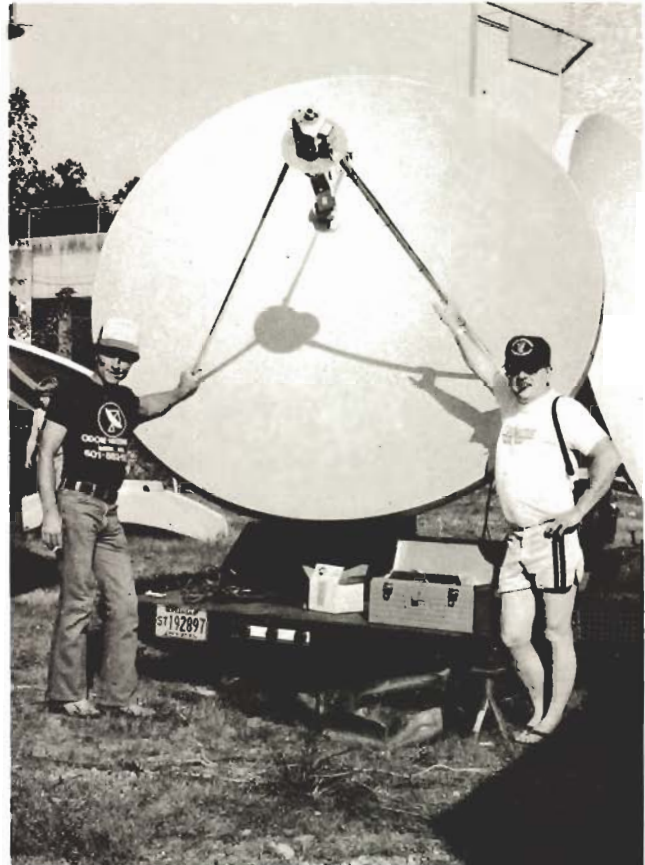


WTBS PRESIDENT Robert J. Wussler gave the keynote address to the jam packed Friday opening session. Among the 'good news'; WTBS, the station itself, has no objection to home terminals viewing their signal. He, in fact, encourages such viewing. And, Wussler and Turner have recently been in Europe working out arrangements to put at least the CNN service (or a form of it) into European countries via Intelsat; timeframe 1983.

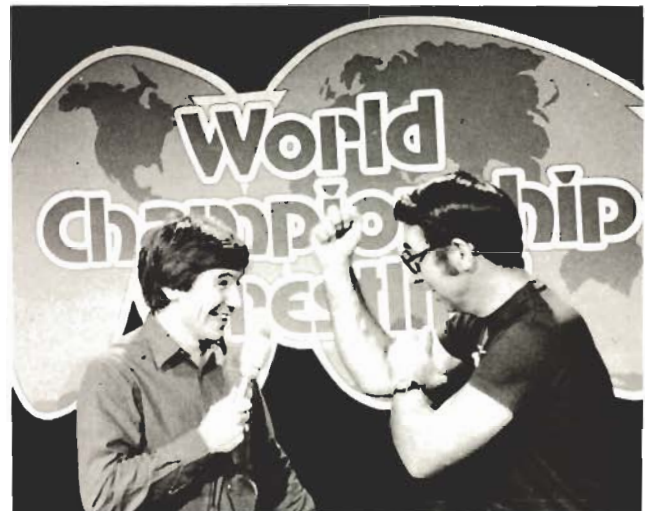
terminals in the Caribbean which were not capable of high quality reception on more than six of the F3R transponders. We didn't resolve that question at Atlanta; it being obvious that the marketplace itself will decide whether six to 20 channels is enough, or whether you have to sell 40 plus channels to be doing a suitable job for the buyers.



FIRST landing party???



GOOD PERFORMING 8 FOOTER / Randal Odom of Odom Antennas (P.O. Box 517, Beebe, Ark. 72012) had excellent pictures from his 8 foot dish system.



JOHN RAMSEY (left) and Coop 'fooling around' inside the WTBS studios during a break in the Saturday morning taping of 'World Championship Wrestling.' John's Sat-Tec displayed a new ultra lightweight, ultra-compact TVRO receiver that can operate totally from a direct 12 VDC battery connection making worldwide operation feasible with a transportable Luly antenna and an LNA that will also function from 12 VDC. Anyone who missed touring WTBS/CNN/CNN-2 while in Atlanta missed an opportunity of a lifetime. John advises you to take your own chauffeur with you.

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At least one attendee is building some substantial size antennas within South America now (6 to 9.35 meters in size) and there were other indications that the industry will, during 1983, see some rather substantial antenna and receiver manufacturing endeavors starting up and mushrooming throughout South America. It would not be wise to assume that all of the hardware that will be sold into the Caribbean, South and Central America in 1983 will be originating in the USA/Canada or Japan. Local industry is going to pick it up and develop regionalized industries throughout the western hemisphere in the year



INSIDE CNN / "The most amazing building I have ever been inside of" (Dave McClaskey, Intersat).

ahead.

The Atlanta show is now history. The next show will be held March 15, 16 and 17 in Las Vegas, Nevada at the Riviera Hotel. And that gives everyone less than four months to gear up for the next onslaught of new technology and new approaches to marketing. The fun is just getting started!

THE FIGURE '8' CURVE

Regular CSD readers will be able to recall travellers' tales of distant lands where the satellites don't stay fixed in one geostationary spot, but dance a little daily jig across the equatorial plane, making all the earth terminals follow them around at great expense. No, I'm not talking about Molniya, those eccentric Russian birds that take turns in the limelight at 40,000 km apogee over 63° north, thanks to their ingenious 12-hour orbit. I refer here to satellites with orbital inclinations of half a degree, or one, three or even ten degrees. They have names like Symphonie, Gorizont and Intelsat.

By orbital inclination I mean that instead of the satellite going around the earth always in the plane of (that is directly over) the equator, its orbit is tilted. The laws of physics demand that the center of the orbital circle (or one focus if the orbit is elliptical) must coincide with the earth's center of gravity. Or, near enough, its center. So an orbit parallel to the equator but (say) three degrees to the north, cannot exist. Start a satellite off here at the correct velocity for a circular orbit at geosynchronous altitude, and the resulting orbit will have a three degree inclination, spending twelve hours per day north

of the equator and the other twelve hours south of the equator (see inset to figure 1). The orbit's center will coincide with the earth's center.

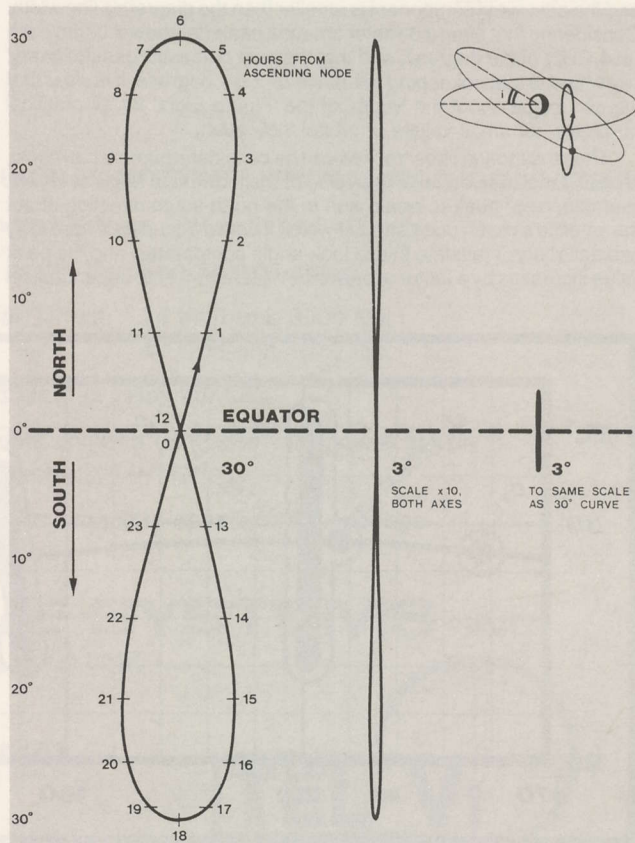


FIGURE ONE / SHAPE OF FIGURE '8' CURVE

by Stephen J. Birkill
Sheffield, England

If the orbit has a 24-hour period, the **mean** (average) satellite location will remain fixed relative to the rotating earth's surface. But the **instantaneous** location of the satellite will swing north and south of the equatorial plane over the 24-hour period. If the orbit is truly circular, the path traced out by the satellite is a long, slim figure-eight shape relative to the mean location, or to the mean sub-satellite point on the rotating earth.

Now this figure eight has apparently been the subject of some misconceptions among those new to inclined orbits. In the past I have spoken of **high** inclinations, but some have taken this to mean a high orbit, while others thought I meant high elevation. A higher (than geosynchronous) orbit would cause the satellite to appear to drift westwards relative to the rotating earth — the period of greater than 24 hours means the satellite is no longer geosynchronous. A higher elevation can result from the orbit's inclination, but we might equally expect to see a lower elevation, dependent on time of day. Perhaps I should have spoken of **large** inclinations.

The shape of the figure eight might also surprise some people. At left, in **figure 1**, is the locus of the sub-satellite point for a circular geosynchronous orbit of 30 degrees inclination (orbital plane tilted 30° from equatorial plane). Unmistakably, a figure eight. The numbers along the curve represent time in hours from the ascending node, the point where the satellite crosses the equatorial plane in the north-bound direction. In fact the orbital period is 24 hours in sidereal time, equivalent to 23 hours 56 minutes 4.09 seconds in **mean solar time**, to allow for the earth's progress around the sun during the course of one rotation.

But we don't find **many** communications satellites with orbital inclinations as large as this. Three degrees is a more common value for the inclination. At center of **figure 1** is shown the equivalent curve for this value. For comparison with the 30° curve, I have expanded the scale by a factor of ten. The difference in shape is obvious — the width of the curve in the east-west direction is very much smaller in proportion, in fact it amounts to less than ± 0.04 degrees in longitude. Scale it back down (at right of **figure 1**), for size comparison with the 30° curve, and the east-west component is smaller than the diagram's line width. Considering that even a 6-meter antenna has a half-power beamwidth (at 4 GHz) of 0.9 degrees, and that the best domestic 'geostationary' birds have a stationkeeping tolerance of ± 0.1 degrees, it is clear that we can forget about the 'width' of the 'Figure Eight' for all practical purposes, for small values of orbital inclination.

Thus the motion to be tracked can be considered simple harmonic, of peak amplitude equal to the value of the inclination angle (3° in our example, or 6° peak-to-peak) and in the north-south direction about the satellite's mean position, that which it would occupy if it were truly geostationary. Translate this to look-angle coordinates, and the peak value increases by a factor of between 1.012 and 1.178, dependent on

location of the earth terminal. This is on account of the terminal always being nearer to the satellite than the earth's center, where the inclination angle is specified. So the north-south motion will subtend a greater angle at the earth terminal, largest of all at the sub-satellite point. The maximum angle any terminal must track through will be $2 \times 1.178 \times i$, where i is the satellite's inclination angle. So where $i = 3^\circ$, the **peak to peak** diurnal movement of a tracking antenna on earth will be at most **7.07 degrees**. This approximation holds for small values of i , say less than 10° . The direction of motion, north-south at the satellite, will appear tilted at the earth terminal (as does a satellite's 'vertical' polarization) for satellites **away from** the meridian. **Figure 2** shows just a small (but interesting) portion of my sky here in England, in coordinates of azimuth and elevation. The geostationary arc curves across the sky, reaching its maximum elevation at my meridian (about 1.5 degrees west of Greenwich). Along it I have marked some of the satellites I regularly observe. To give an antenna's eye view I have limited satellite resolution to that which a 6-meter antenna would see (black blobs and bars). The larger circular and elongated outlines represent the lower resolution of a 3-meter antenna, at 4 GHz. Most of the Intelsats, certainly the main Atlantic cluster, have inclination angles smaller than the antenna beamwidths shown (in fact less than 0.2 degrees) and appear as circles. But three satellites, Intelsat IV F2 at 1°W , Gorizont-2 (or 4?) at 14°W and the pair of Symphonie birds at 11.5°W have substantial inclination angles, and their images are elongated across the orbital arc to indicate the extent of uncertainty in their instantaneous positions. I say instantaneous, but remember the cycle takes 24 hours to complete, so apparent motion is slow.

It can be seen that I need to track Intelsat IV F2 in elevation only, as it sits very close to my meridian. But Symphonie for instance moves in an apparently tilted line, a tilt which is greater for satellites away from the meridian. So in the general case an el/az mount must move about both axes to track an inclined orbit bird.

A tracking polar mount, by contrast, makes the orbit look like a straight line, so our north-south motion is always perpendicular to this. To a close approximation all such motions are in **declination only**, whichever part of the sky the satellite may appear. This makes the polar mount the preferred system, requiring just an extra jack or actuator to steer the antenna by plus or minus perhaps five degrees in declination (north or south of the equatorial plane) quite independently of the normal **hour angle** drive which scans it along the orbit.

To make such tracking automatic, there are two fundamental approaches. Firstly we could program the steering computer with the orbital elements and perturbing forces, so that the antenna always would know where the satellite **should** be. Any stationkeeping maneuvers would require input of new data to keep the computer model current. The second approach is to give the system a form of auto-tracking, so that once locked onto the satellite it follows it automatical-

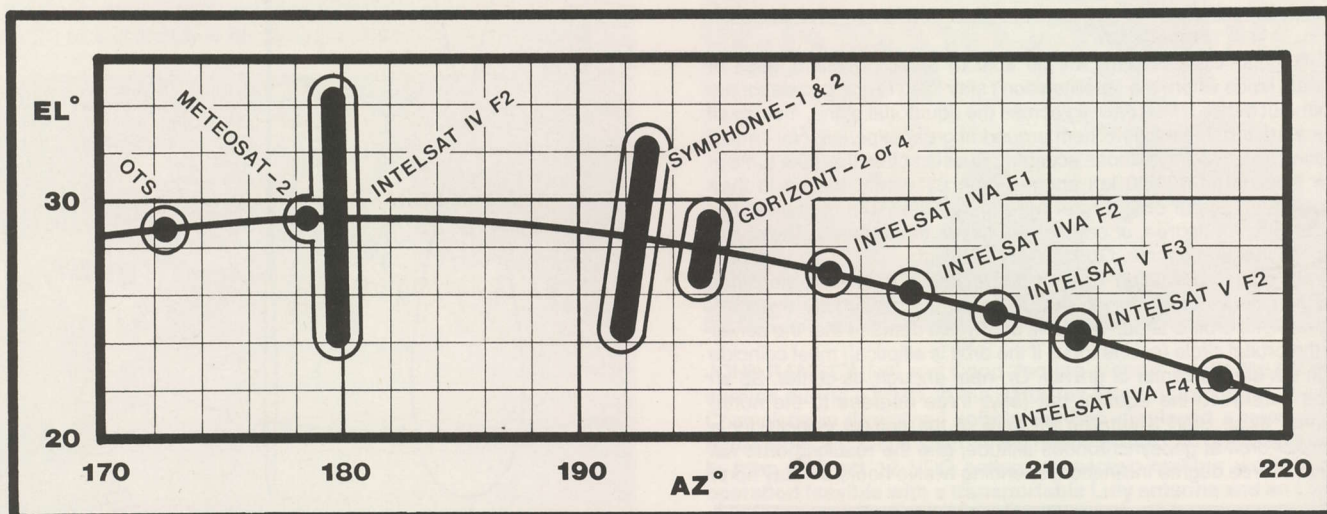
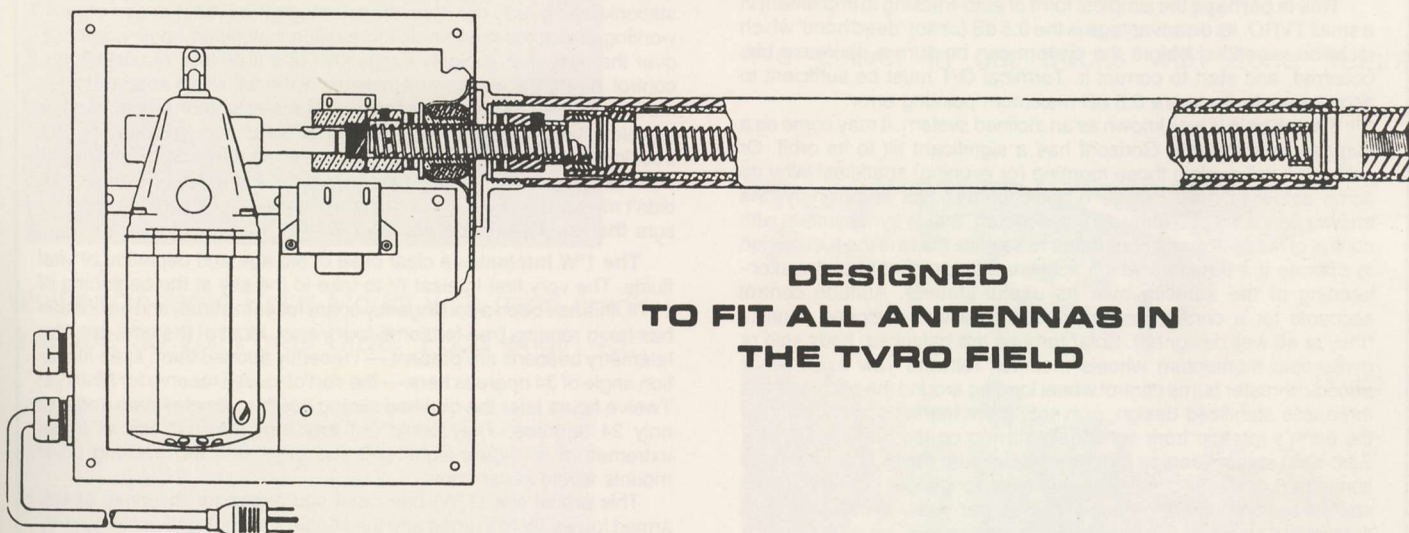


FIGURE TWO / Az-EI PLOT OF PART OF SKY, SHOWING INCLINED ORBIT BIRDS

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ly. Ideally this requires a beacon, though the downlink can be used if it operates continuously. If not, then either an inhibit and reacquisition routine must be built in, or a hybrid of the prediction and tracking modes be employed.

The Russian 'Moskva' 2.5-meter TVROs incorporate a simple low-velocity step tracking system. The received signal strength is sampled at intervals and compared with a previously stored sample. If it has declined by more than a predetermined amount (say 0.5 dB) than a simple search routine is conducted, in which the antenna (in fact they move the feed) moves a small step in one direction and a new before/after comparison is made. If signal has declined the direction is reversed, if it has increased a further step is made. When a **maximum** has been found about one axis, the procedure is repeated about the orthogonal axis. Content that it is peaked, the control system settles back into its normal long integration period until satellite motion results in another significant decrease in signal level.

This is perhaps the simplest form of auto-tracking to implement in a small TVRO. Its disadvantage is the 0.5 dB (or so) 'dead band' which must be exceeded before the system can be sure a decrease has occurred, and start to correct it. Terminal G/T must be sufficient to accommodate the extra 0.5 dB maximum pointing error.

Symphonie is well known as an inclined system. It may come as a surprise to some that Gorizont has a significant tilt to its orbit. Or perhaps it will explain those morning (or evening) sparklies! Why do some satellites make things difficult for us? Not surprisingly, the answer concerns economy. In a spacecraft, that is synonymous with control of mass. A major contributor to satellite mass is the fuel carried to operate the thrusters which achieve attitude control and station-keeping of the satellite over its useful lifetime. Attitude control accounts for a certain amount of fuel in a well-designed satellite (they're all well designed). Solar torques are balanced, body spin or gyroscopic momentum wheels maintain roll and yaw axes, while periodic thruster burns control wheel loading around the pitch axis in a three-axis stabilized design, preventing the inertial accumulation of the earth's rotation from continually driving up the angular velocity. East-west stationkeeping requires a maximum mean acceleration of some 2.25 m/sec per year, dependent on longitude, but north-south stationkeeping requires around 45 m/s per year, accounting for a substantial chunk of the total fuel.

Stationkeeping regimes vary. Clearly a ± 0.1 degree N/S and E/W specification demands more frequent burns than say a 1.5 degree specification. The fuel requirement is much the same. Economies can be made in north-south stationkeeping by making use of the perturbing forces. In the absence of correction, an orbit of small inclination will change its tilt by approximately 0.86 degrees per year, as a result of the perturbing forces of (principally) solar and lunar gravitation. If a maximum inclination of 3 degrees could be tolerated in a satellite with 7 years design life, it could be inserted into an orbit with three degrees tilt in such a plane that over the first $3\frac{1}{2}$ years the external forces would steadily reduce the inclination from three degrees to zero, and then out to three degrees in the opposite direction over the remaining $3\frac{1}{2}$ years of life. That way, north-south stationkeeping could be dispensed with completely, allowing (say) an extra communications transponder to be carried, plus the increase in solar array dimensions to provide the additional primary power.

This type of flight plan was originally proposed for ECS (Euro-sat), the European Communications Satellite, but subsequently revised on account of the extra ground segment costs it would have incurred, particularly on low cost (small) terminals. As with most domestic satellite systems, 0.1 degree stationkeeping means that even the largest antennas do not require autotracking systems.

But, the very fact we speak of stationkeeping even down to a 150 km 'cube' indicates that 'geostationary' is a misnomer. The most accurately controlled satellite will drift due to the external forces, and the best we can say is that its orbital period is close to the length of the sidereal day, that it is more or less geosynchronous. The principal east-west perturbation comes from the earth's triaxiality — it is not perfectly circular at the equator, physically or gravitationally. Around the globe there are two gravitational 'troughs' (near to 105°W and 75°E) into which 'loose' satellites tend to slide. Between these are two 'peaks' (near 11°W and 162°E) of unstable equilibrium, where the east and west forces balance. And between each peak and trough is a

region of maximum east or west influence, demanding extra east-west stationkeeping ability.

Symphonie was designed for $\pm 0.5^\circ$ stationkeeping tolerance, with the option of going to $\pm 0.1^\circ$ if operations should demand it. With the two spacecraft approaching the end of their nominal lives and the possibility of total depletion of fuel, stationkeeping regime was relaxed. The result, totally predicted, is the present value (or values) of orbital inclination, about 3° for the F1 bird and 3.5° for F2. The two spacecraft have remained in near phase synchrony in their diurnal motion (I mustn't say motions), simplifying operations in that the two can still operate as if they were a single 4-transponder satellite. But those inclinations continue to increase — it is not known whether any north-south stationkeeping ability remains, **but if unchecked**, F2 will exceed 4° inclination before its replacement, France's **Telecom-1**, is launched in 1983.

As for the Atlantic Gorizont, we do not know the state of its stationkeeping fuel, nor even the tolerance the Soviet engineers are working to, but the monotonic increase in inclination angle observed over the past year is highly suggestive of a total loss of north-south control. Already at one degree inclination, the satellite's apparent daily motion exceeds two beamwidths of a 6-meter antenna, and smaller installations are feeling the need of a daily nod. Incidentally the tracking agencies still seem divided over whether Gorizont-2 is at 14°W and Gorizont-4 at 90°E or vice versa! They can't be sure they didn't mix up the two birds at the time they shared the 14°W slot. I'm sure **the Russians** know which is which!

The 1°W Intelsat is a clear case of old age and depletion of vital fluids. The very first Intelsat IV to take to the sky at the beginning of 1971, this has been a contingency spare for some time, and inclination has been running free for some four years. Most of the time only the telemetry beacons are present — I recently spotted them at an elevation angle of 34 degrees here — the sort of value I reserve for Molniya! Twelve hours later the bird had swung south to an elevation angle of only 24 degrees. They could put **anything** on that bird at those extremes of its 'figure-eight' and you guys with the tracking polar mounts would never know.

This orbital slot (1°W) has been suggested for the relay of US armed forces TV to Europe and the Middle East but such a service will not use Intelsat IV F2. The most likely contender is F4, now bound for the 1°W slot after a long (slow) drift from the Pacific Ocean Region. At 0.5° inclination, it's a lot more accessible for a year or so, at least.

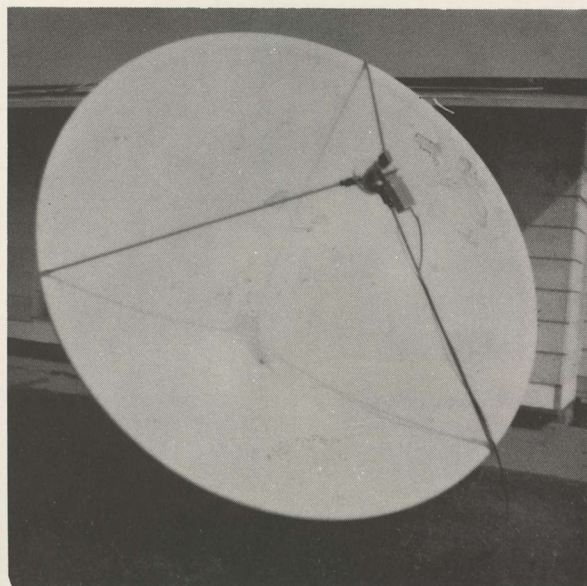
Intelsat observers will be familiar with the antics of 53°W Intelsat IV F7. There is still **some** doubt about whether the Mexicans are on full or half transponder operation. Even bearing in mind that half-transponder TV is typically 7 dB below full (saturated) transponder power, reports are ambiguous. Someone suggested a hemispheric beam, but since when has an Intelsat IV bird had that capability, introduced with the frequency-re-use IVA series? More on that in a future article (and more on Symphonie next time), but for now I note that IV F7 has an inclination a little over 0.4° . It replaced (earlier in 1982) IV F3, whose inclination had increased from 0.4° to 0.8° while on station at 53°W.

More and more of the Intelsat IV satellites are facing retirement with sick transponders and wandering orbital planes, but so far the Intelsat IVA series are all looking particularly healthy, with just the odd one breaking 0.1° inclination from time to time. East-west stationkeeping has looked particularly good on all the Intelsats over the past year, in most cases up to **domestic** satellite standards. Circularity likewise has been closely controlled (a departure here results in an east-west apparent diurnal motion) with eccentricities of 0.04 or less, while on station.

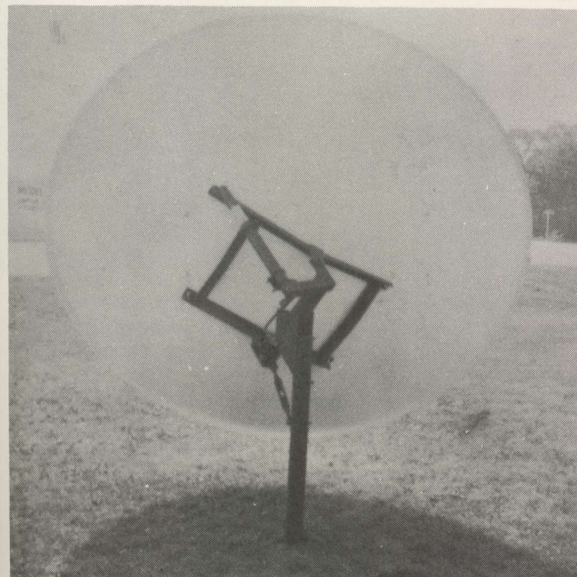
Latest development in the Atlantic region is the appearance of Brazil's **Rede Globo** on (approximately) global beam of Intelsat IVA F2 at 21.5°W, transponder 6. EIRP is near saturated global value of 22 dBw beam edge, though there is evidence of occasional additional traffic at the upper transponder edge, similar to 'enhanced half-transponder' operation but with minimal back-off. System is PAL-M: 525 lines, 60 fields, 3.58 MHz color subcarrier — just like NTSC except that color phase is line-switched as in the PAL system. Audio subcarrier is 5.8 MHz. Intelsat transponder 6 corresponds to Satcom transponder 11.

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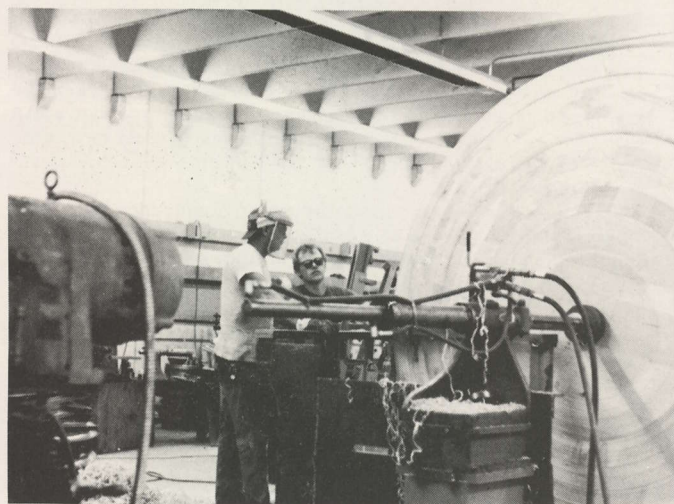
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SOUTH AFRICAN INSTALLATION

I find myself aboard Pan Am flight 181, bound for New York City. I am returning via New York to home in South Florida after spending a very educational week in another south; **South Africa**. And while there, I have had my first, first-hand experience, with the installation and operation of one of the Hero Six Meter Super Tenna systems at a location far south of the equator.

Since I last reported in **CSD** (April 82 issue, reporting on the installation of a six meter TVRO in Cameroon; at 2 degrees above the equator), my travels have been brief and closer to home. During the interim period our large six meter antenna has been expanded with a new 7.5 meter motor driven antenna and the first of these new 'really big' home style terminals have been going into places such as Caracas and Bogota.

In many ways, I elected to send myself to South Africa because of the popularity of the larger 7.5 meter versions; when the opportunity to install a six meter antenna in Johannesburg arose, I checked the schedule and found that our three primary antenna installation engineers were 'booked up' with rush 7.5 meter installations.

But there were other considerations involved and each played a part in my electing to make the 24 hour trip from Miami, and return. For example,

No Hero antenna, and to the best of my knowledge, no other 'large,' private terminal had ever been installed in such a southerly location. There remains a certain fascination attached to bringing first-time satellite television to an entire new region of the world. There are no new 'continents' nor 'straits' left to be named after satellite 'explorers,' but there is considerable personal satisfaction connected to being the first into an area.

Hero recently completed three six meter installations in Saudi Arabia and Kuwait, and it was here that the striking contrast between the Indian Ocean Intelsat, and the Atlantic Ocean Intelsat birds was first recorded. Harold, one of our field engineers, had made each of those installations, and I, frankly, lacked his command of that **first hand** knowledge. I wanted to experience that, and, to see what else there was to learn about an installation that produced multiple satellite service from two separate Intelsat 'clusters.'

Hero had just completed development of a rather exotic satellite receiver package; the foundation of which is an AVCOM receiver conceived for switchable half and full transponder formats. Our embellished receiver has the unique ability to separately tune in video on one (full or half) transponder, while searching for, locating, and locking in on the companion program audio even though it might be one or twenty one transponders removed, and hidden and buried in amongst a bevy of other SCPC type carriers. I wanted to take that receiver where its performance could really be challenged.



ISAAC WAGNER has accumulated a fair amount of video and test equipment in his search for high quality satellite pictures. Now that investment should start to pay off.

Finally, the purchaser of the six meter Hero was Isaac Wagner. I had first been introduced to Isaac way back at the Miami SPTS event staged by Coop in February of 1980. I knew Isaac had maintained a keen interest in private TVRO reception in the intervening years. I also knew that he had installed a small (for practical Intelsat reception) ADM 13 foot antenna, and most recently an ADM 20 foot antenna. It was the latter that caught my attention since in all honesty I consider Jamie Gowan to be a tough competitor, and the ADM 20 footer to be competition to our own six meter antenna. If I went to Johannesburg, I would have the opportunity to compare the receiving ability of both antennas.

Isaac Wagner has been struggling with satellite television reception from outside his country for all of the years since 1980. He has invested a considerable amount of money in the project, hoping to find alternate program choices to his local service. Wagner is more than a monied experimenter; he has been driven by the belief that if terminals of a practical size (six meters is, he feels, practical) can produce a **selection** of alternate programming, hundreds and perhaps thousands can be sold in his country. Wagner wants to be the source for such installations.

For those who might believe they detect in what **should follow** some analysis of the relative merits of the Hero six meter and the ADM six meter, a disappointment. You can assume only that in the tests conducted in Johannesburg that the Hero antenna did not disappoint me, nor Isaac. I understand that an ADM antenna will be reviewed by Coop here in **CSD** at a later date, and any direct comparisons between the two will have to await that report.

I arrived in South Africa on October 8th. Isaac Wagner had contacted me after reading about the installation in (French) Cameroon, as noted, in the April issue of **CSD**. After reading of the results there, he had decided to invest in an identical antenna.

His two year experiments with the smaller ADM 13 footer had been a mixed bag. Very few of the transponders ever produced useful programming reception and the lack of ready horizon to horizon accurate tracking put a severe crimp on exploring the skies. When I arrived Isaac had the ADM 13 footer as well as the newer ADM 20 footer operational. We spent the first evening exploring how they worked, and comparing the improvements noted with the 20 footer over the 13 footer. Isaac had planned to install the new Hero six meter on a pad already in place. Unfortunately the pad was positioned such that there would be blockage and interaction with the existing ADM 20 footer so we decided a new pad had to be built.

The next morning Isaac began work on the new form for the Hero six meter pad, after we selected a location for it. I had calculated the height of the form and we made a trip to a local lumber yard to purchase the materials. As Isaac constructed the form and I worked on the antenna I sensed that perhaps the form, as being constructed, was not going to hold the ten tons or so of wet concrete. Isaac felt

VENTURE BELOW THE AFRICAN EQUATOR

by
Robert Behar
Hero Communications
Hialeah, Fl.

TEXT CONTINUES / page 33

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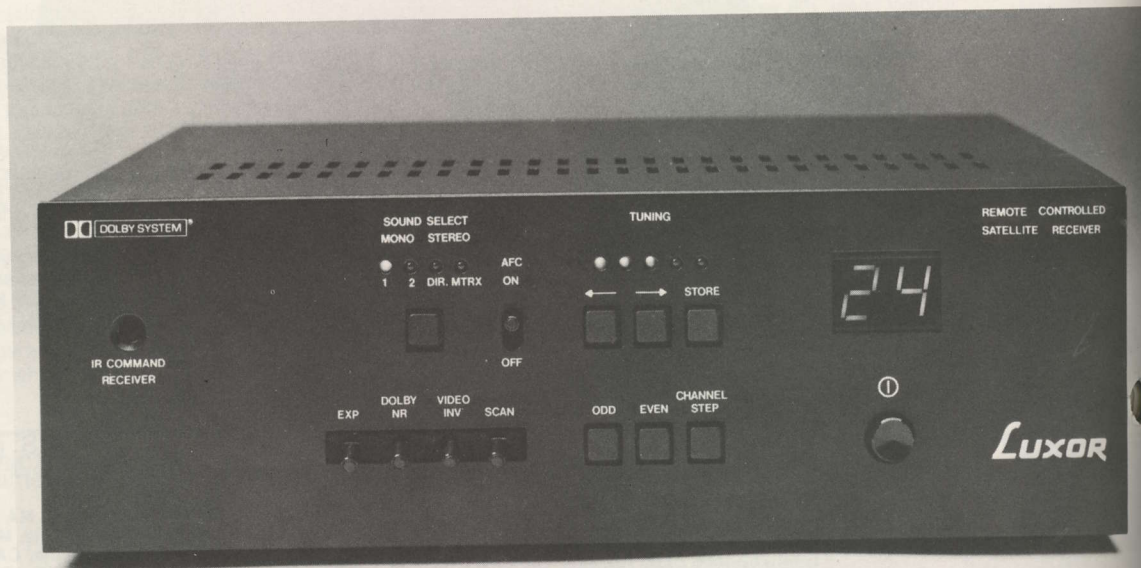
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Automatic Polarization With Chaparral Polarotor	●			○	○				
Video Invert	●	○	○	○	○		○	○	
Two Scan Speeds	●								
LED Channel Display	●	○							
Audio Section									
Four Programmable And Tuneable Audio Systems	●								
Mono 1, Mono 2, Direct Stereo, Matrix Stereo	●				○				
Dynamic Expansion	●								
Dolby Noise Reduction	●								
Infra-Red Remote Control									
Direct Access Any Transponder With Chaparral Polarotor	●								
Automatic Polarization (Polarotor)	●								
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All Audio Systems Infra-Red Tuneable	●								
Fine Tune Polarization (For Satellite Skew)	●								
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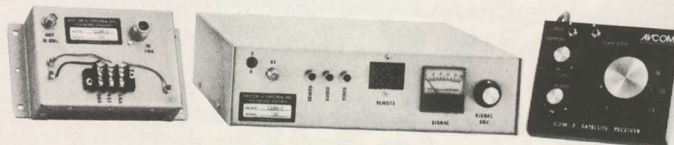
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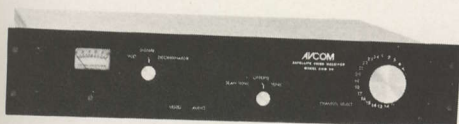
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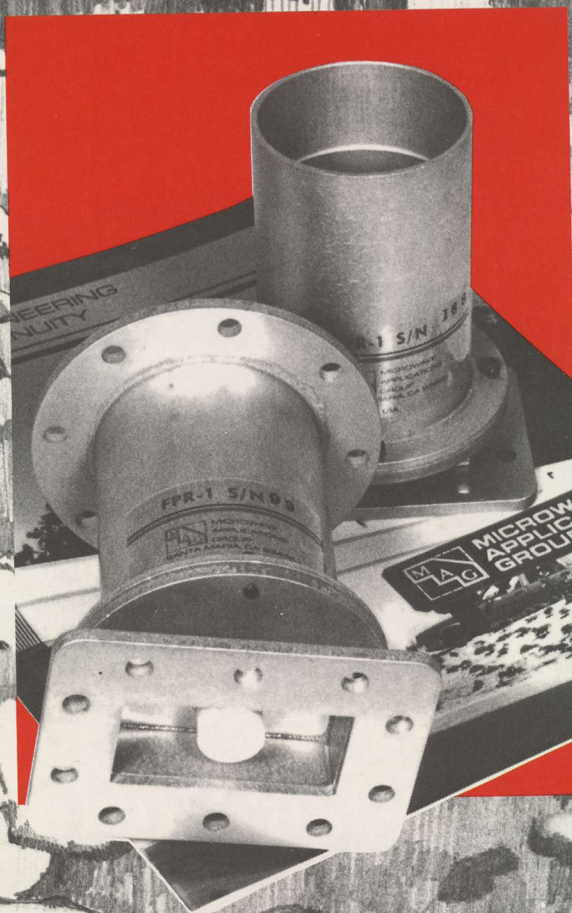
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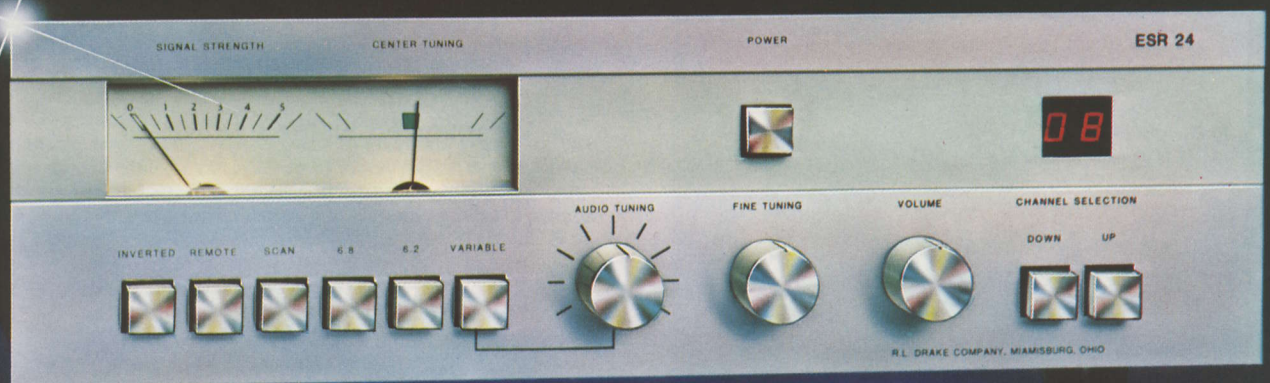
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ONE DESTROYED wall, a busted truck mirror and headlights damaged before the truck was finished. And then the form busted loose!

otherwise and proceeded. I had to keep reminding myself that I **was** south of the Equator, and that everything was turned around. The form, I tried to convince myself, 'would hold' simply because we were south and not north of the equator. I would later remember that thought.

The concrete truck pulled up and in the process of getting into the site the driver managed to demolish a set of mirrors and his front headlights; as well as inflicting some damage to the surroundings. **Now** I was certain that basic laws of physics don't change south of the equator and the form would never hold. And sure enough (see photo) the form gave way as the mass of wet concrete poured into the form. Bob Cooper built one of his Hero pads using native stone and fine island masons. Isaac Wagner has his six meter Hero sitting on top of a piece of modern 'concrete sculpture.'

With that episode behind us, work on the antenna resumed with vigor. And it continued through the afternoon until the weather moved in. We then moved inside to tackle another problem Isaac was having with his reception.

In his 'stable' was an AVCOM COM 3 receiver, with no AFC. That automatically told me the receiver was at least two years old. The second receiver was another AVCOM, a more modern single conversion package with both AFC circuit and meter. We tuned in a signal from a Russian satellite which Isaac had warned me was subject to 'flashing.' As soon as I saw the reception I knew:

- 1) The receiver bandwidth was too narrow for the slightly wide Ghorizont modulation;
- 2) The receiver in use with no AFC, and with the slightly wide Russian signals flowing through it, was not able to track the signal.

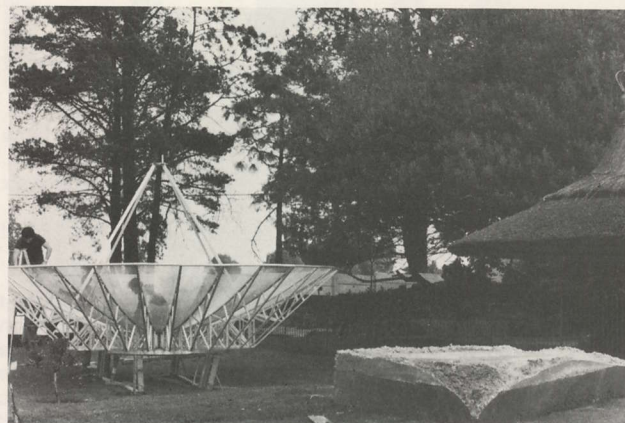
The problem was identified and fixed. And by now the weather had cleared so we moved back outside for some additional assembly on the antenna. But it lasted only a short period of time for soon it was 40 degrees F and the wind was coming up. There being no press for time, we elected to call it a day.

Inside again, Isaac introduced me to South African terrestrial television. Now I would see what 'the competition' was doing. I quickly discovered why there is such a pent up hunger for additional television.

The South African Broadcasting Company apparently limits its television day to four hours per day. If that sounds a bit on the short side, two of those four hours are in native Afrikaans. The highlight of Saturday night television was 'More Real People,' followed by a science fiction movie, and news. 'Highlight' may be a generous term. That was the **total** evening programming!

I was now beginning to share Isaac's strong feeling that the market in South Africa might indeed be 'huge' for private terminals. If we could just get some high quality pictures! Tomorrow would be another day.

Early Sunday morning we began the task of attaching the mesh surface to the antenna. There were three of us working, and I asked Isaac how he planned to get the dish onto the mount. "**Man power**"



VERY STRANGE PAD indeed (right). Isaac promises the next time he will spend more time calculating the side thrust of ten tons of wet concrete!

he replied. So we began rounding up some help. Punda, the houseboy was dispatched with instructions to find at least eight 'strong' friends. Twenty minutes later they returned and I began the task of explaining just exactly how it had to be done, where care had to be exercised, and what each person was going to do. It was a familiar scenario for me; much like Cameroon or dozens of locations closer to home.



ONE SLIGHTLY concrete speckled SPACE 'T' shirt later, the author can report he has indeed poured concrete on both sides of the equator and on four continents!

The whole antenna went up without any problems. We stopped for dinner, and later returned to wire up the LNA, rotor, receiver and support equipment. As we started the alignment procedure the bad weather returned and persisted. So that was it for that night.

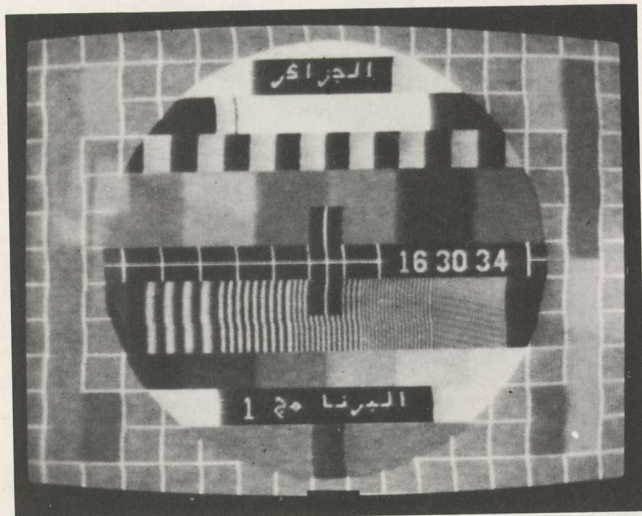
Dawn came and we began by leveling the base on the antenna. Remember our base had suffered when the form collapsed. **The base must be level**, or the antenna will not track from horizon to horizon. Isaac certainly has the most "unusual" base I have ever placed a six meter antenna upon!

Then we connected up all of the cables and we were ready. Except the satellites were not ready.

One of the things you learn early, when working with the Intelsat birds, is that very little happens on **any** bird prior to about 12 noon Greenwich time. By actual fact, prior to 12 noon there is only a single active channel over the Atlantic (the Russian signals aside) and none above the Indian Ocean. Isaac decided we should take a few hours so he could show off his city. This is an opportunity I seldom avail myself of and not wishing to go home after traveling half way around the world and not be able to describe the country I visited ("well, there were three satellite antennas in this yard . . ."), I agreed. What little I knew about South Africa had come from the occasional US television or print media source that usually lingered on the alleged racial problems. I had the opportunity to see much more.



RUSSIA is good, but not perfect. But there are three Russian birds visible in Johannesburg.



SAUDI is much more than strong; it is BIG and FAT!



TWENTY FOOT Hero six meter (foreground) and 20 foot ADM (background) plus a 13 foot ADM make up the three antenna 'farm' for Isaac Wagner. Wagner has paid his 'dues.'

Johannesburg is a very modern, cosmopolitan city. It is beautiful in every respect. It is perhaps the cleanest city I have ever visited; you could literally eat from the sidewalks. The people are very friendly, and very helpful. Beyond that I will leave in the hands of more accomplished writers.

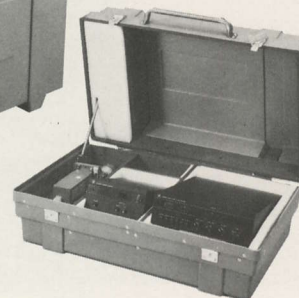
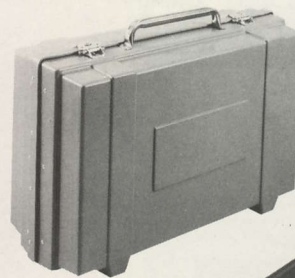
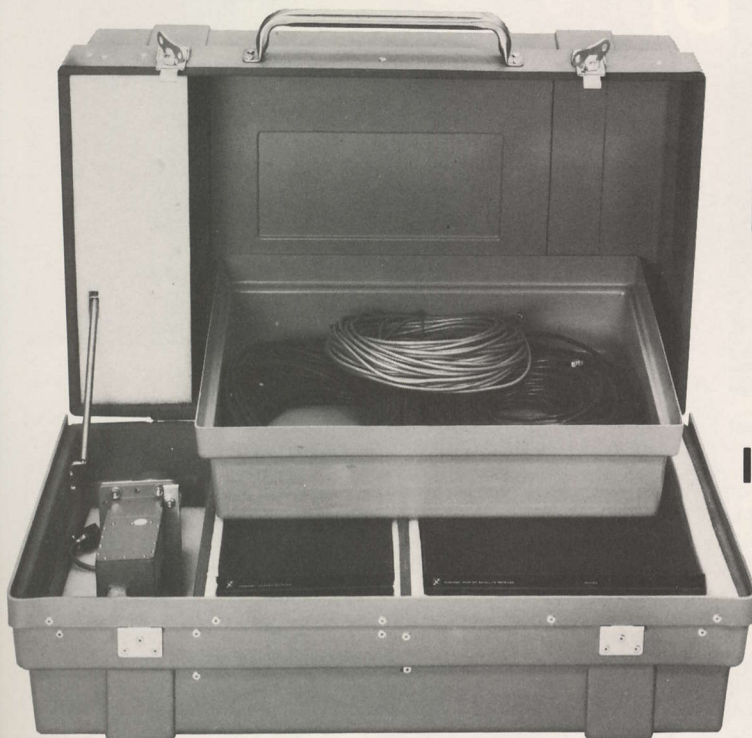
After lunch we got down to the serious stuff. Isaac's eyes lit up like Christmas tree bulbs when we hit the first 'fat' signal. He had never seen such quality pictures. I suggested he contain his enthusiasm; there was more to come.

Our alignment exercise began over the Indian Ocean, with the Intelsat cluster located there. There were three operational Intelsat birds as well as the eastern version of our friendly and well known G(h)orizont which we see in Miami from 14 west. The Indian Ocean Intelsats have a surprising amount of daily, regular, scheduled use. In English. There is, for example, a BBC newscast followed immediately by an ITN newscast. Meanwhile on an adjacent Intelsat bird there are leased channels in use for Algeria, Nigeria and Oman. The third Intelsat is loaded with a considerable amount of telephone and data traffic, and some (occasional) video. Next there is a Russian G(h)orizont bird which has a single channel visible in South Africa. Details of its programming is found in the new STT1 'International Handbook,' by the Dean of all of this, Steve Birkill.

At the time of our tests in early-mid October, there was also a second G(h)orizont in operation over the Indian Ocean, and while it was carrying parallel (same) programming, the programming was on a different transponder from the first noted.

Jumping to the Atlantic cluster we quickly found the familiar to most of us G(h)orizont bird at 14 west. And here was a surprise. The

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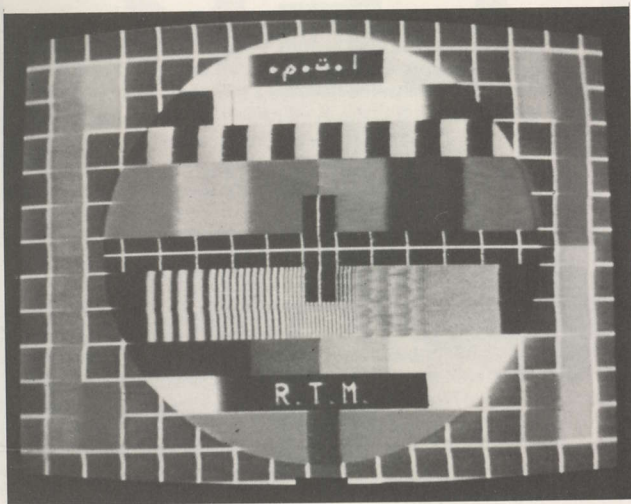
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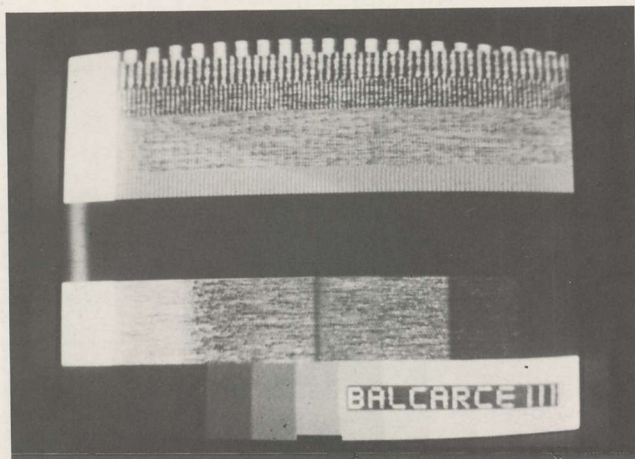
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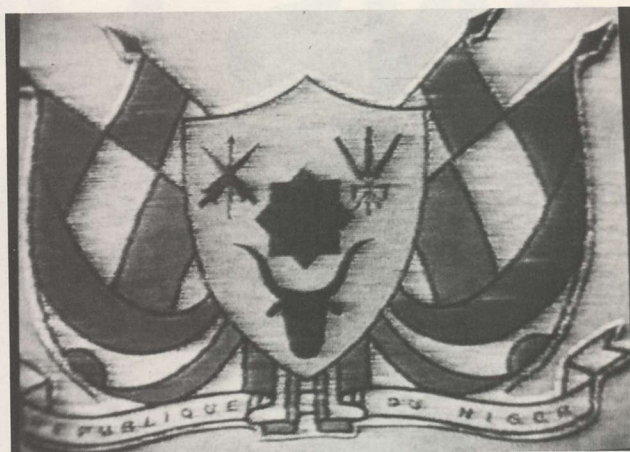
MOROCCO is strong enough that even the red portion of the test pattern has no sparkles or tearing. J.R. in French yet!

big, fat signal which has been in use by people like me for years, on (US receiver or dial position) 9, from Cameroon to Saudi to Caracas to Washington, DC was . . . virtually **not there** at all. I could detect a poor quality black and white picture, but hardly the meter busting signal level we expected north of the equator. Could the Russians be employing a **northern** hemispheric beam on **this** transponder? Remember that this channel came pouring into Cameroon, at 2 degrees north. But here, at 25 degrees south, it was barely detected. On the other hand, the same bird was delivering a very healthy signal (if not perfect) on (US dial position) transponder 1; a signal that was not detected **at all**, in Cameroon. Perhaps it was turned off while I was there; in any event there is some evidence that TR1 may be southern hemispheric while TR9 is northern hemispheric. The Russians could make life far easier for all of us if they would simply **publish** some reliable data!

After G(h)orizont came a series of five Atlantic basin Intelsat signals. And some more surprises. We received good quality signals from Saudi Arabia, Nigeria, Sudan, Zaire, Morocco and Spain. Oh yes, we **also** found high quality service from **Argentina** and **Brazil**! Next, on the Symphonie bird we found programming from both France and Germany. All of these services are full time, or at least multiple hour per day, **scheduled** from month to month. And that amounts to regular reception from Africa, Asia, Europe and South America. In virtually all of the cases, as noted in the new Steve Birkill manual, the audio appears in the upper portion of the transponder that carries the half transponder video, or it is some number of transponders away as a separate carrier (see **CSD** for November 1982).



ARGENTINA Global Beam is closest service to South American "Super Channel."



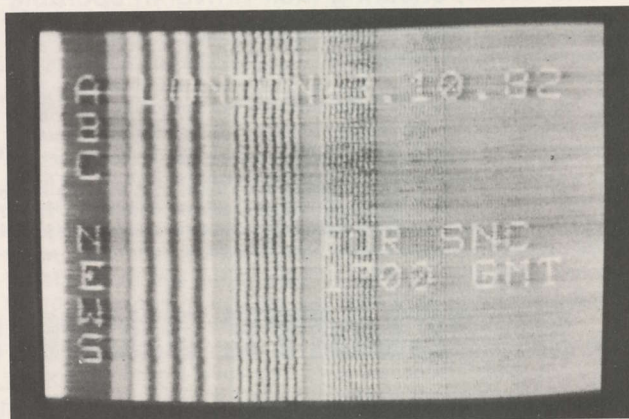
NIGER programming (Republique du Niger) is above threshold.

On the Intelsat transponders, there is a surprising amount of American television as well. Much of this is in the news feed category, going to New York on a regular basis to fit into the early morning USA and early evening USA newscast segment time slots. There is even an ABC equivalent to the (in)famous Max Robinson, seen on Westar 4, sitting in for ABC's Peter Jennings. Jennings is not forced, as Max apparently is or as Max elects to do, to sit down for an hour during 'warm up.' Every evening **this** fellow sits there so the cameras and microphones can be ready for Peter Jennings to rush in, sit down, and do his bit for the evening ABC news feed. Then abruptly, Jennings rushes off to another assignment.

On Morocco's Intelsat feed there are familiar American programs such as Dallas, Quincy, and Eight Is Enough (all in a single day!). During the course of my visit I was able to see J.R. Ewing speak in Arabic, Portuguese, Spanish and French; in addition to English. Arabic, with a Texas accent, is a real gas.

What I learned from all of this is that a six meter antenna is a suitable antenna, if the antenna will track well from horizon to horizon, and if you are prepared 'going in' to play some special games with the audio. A traditional US domestic receiver is a waste of time and effort; even one equipped for switchable half and full transponder format video. **Why?** Remember, with the half transponder leases, the audio never rides with the video in the same half of the transponder. Well, almost never. At the very least, you need to be able to tune in the half transponder video on the **bottom** half of the transponder, while separately tuning in the audio in the **upper** half of the same transponder (see **CSD** for November 1982, page 8).

The other problem is the deviation from a true geostationary 'holding position' which our US and Canadian domestic birds fly. Steve Birkill addresses that topic separately in this issue of **CSD**. The



ABC NEWS to USA is one of the many USA bound feeds you can tune in from Johannesburg.

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right answer, in all honesty, is a slightly larger antenna (you can **always use** a little more margin), such as the new Hero 7.5 meter **with** the ability to fine tweek the elevation adjustment to track those birds as they wander north and south of the equator in their "figure 8" patterns.

Isaac Wagner, meanwhile now figures he is ready to announce a private terminal availability in the southern portion of the African continent. With the promise that 1983 will be bringing us a new batch of Americanized programming on Intelsats over the Atlantic (including, perhaps, some of the Ted Turner WTBS/CNN programming

before 1983 ends), the demand for the terminals should grow rapidly as word spreads. When I left Isaac I had little doubt that process would take very long. His radio and television room was filled with friends and neighbors each exclaiming over the wide variety of reception possible, and the quality of that reception. For Isaac Wagner it has been a long, drawn out two year quest. But the wait has been worth the time and trouble. Now the time has come for that wait to pay off in nice dividends.

1985 LAUNCH DATE FOR NEW AUSSAT

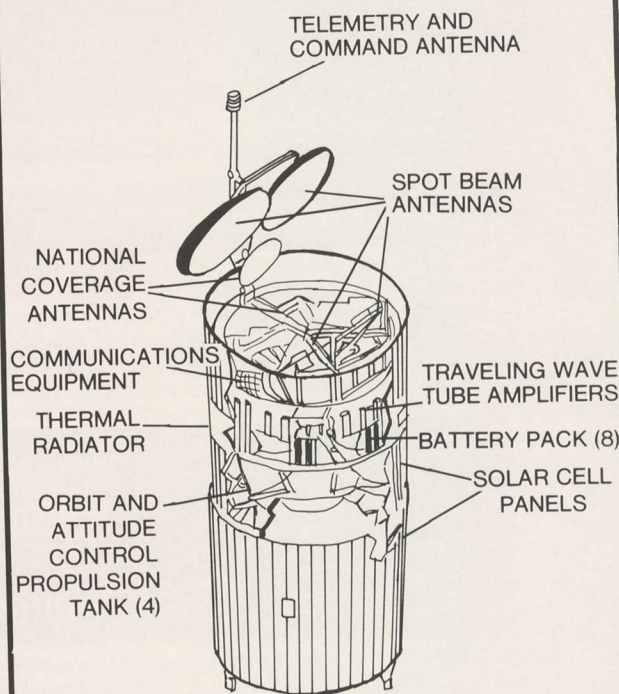
Terry O'Conner is one of those awaiting the introduction of 12 GHz satellite service in Australia. Only Terry is not ready to sit tight until 1985. While he is preparing for that eventual launch, construction on a 16 foot antenna to be equipped with an Amplica 100 degree LNA and an R.S. Technology receiver proceeds. O'Conner is one of a small band of 4 GHz enthusiasts who hopes to bridge the period between now and 1985 with some type of service. His excellent overview of the forthcoming 12 GHz service should help you better understand what satellite communications will eventually mean to the South Pacific.

The first Australian communications satellite is scheduled for launch in 1985. However, although it has been three years since the Commonwealth Federal Australian Government made the decision to build and operate a satellite system, the exact nature of the new system remains clouded in a haze of question marks.

Contracts for 88 prototype earth stations scheduled for use in the initial trial tests of the complete system have now been awarded to two firms. The Minister for Communications, Neil Brown, has announced that twin contracts calling for 44 terminals each for the National Communications Satellite System have been awarded to Codan, and, to NEC Australia (the same NEC of Japanese fame). The Australian Department of Communications plans to purchase 132 prototype earth stations for use in developing the technical standards necessary for the reception planned with the Homestead and Community Broadcasting Satellite Service (HACBSS). This HACBSS service will use frequencies in the 12.5 to 12.75 GHz band and users will have 'low cost' receivers and dish antennas generally in the 1.2 to 1.8 metre class.

The actual transponder space, and who will use or program it, will be up for negotiation within the next month or two.

When the preliminary design review for the new satellite system was completed in Los Angeles, the company established by the Australian Federal Government to handle satellite operations (AUSATT Pty Ltd) had also completed its own design requirements, and



AUSSAT SPACECRAFT CONFIGURATION

the preliminary system design was updated calling for additional on-board-satellite switching to be done in space so that antenna coverage patterns could be reconfigured on demand in space. AUSSAT will shortly establish a schedule of tariffs and operating conditions for the birds. And then, those firms and groups who seek to make use of transponder time and space will have their opportunity to equate proposed charges against their own planned expenditures.

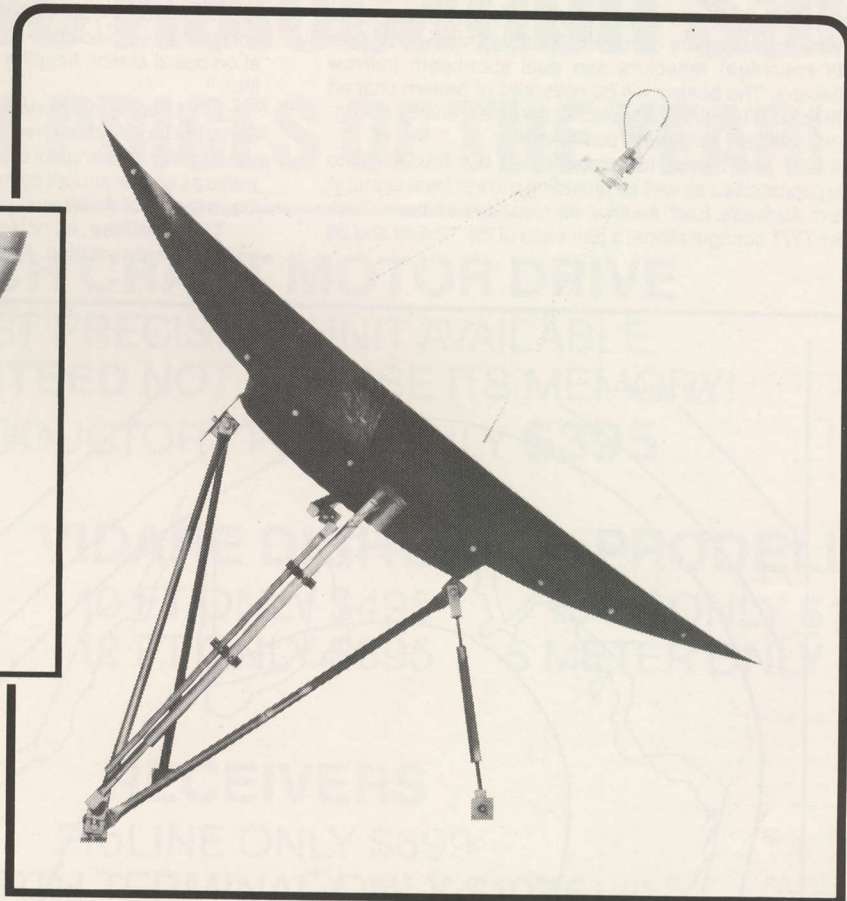
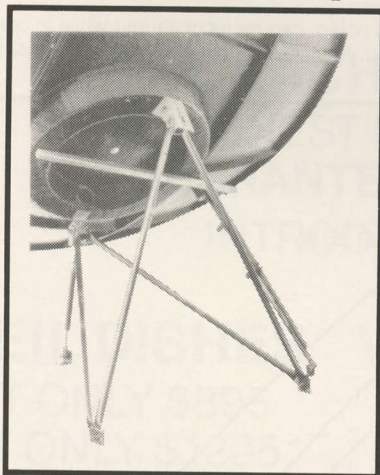
According to Hughes Aircraft Vice President Dr. Harold Rosen, Australia's first domestic satellite system should be operating 'on deadline,' three years from now. One apparent reason for Dr. Rosen's confidence is that the Hughes/Australia contract advances to 23 the number of Hughes HS-376 series (D class) satellites which Hughes is scheduled to build. Others in the same **general family** include SBS, Indonesia's Palapa B, Telestar 3 and the most recent Westar series birds.

AUSATT signed a contract with Hughes this past May, and the contract calls for three identical spacecraft with an option for a fourth; plus, two ground TT&C ground control stations. When Dr. Rosen was in Australia for the formal contract signing he noted that the most salient 'difference' between the AUSSAT birds and others in the HS 376 family is antenna system. Australian satellites will each have

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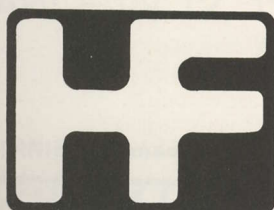


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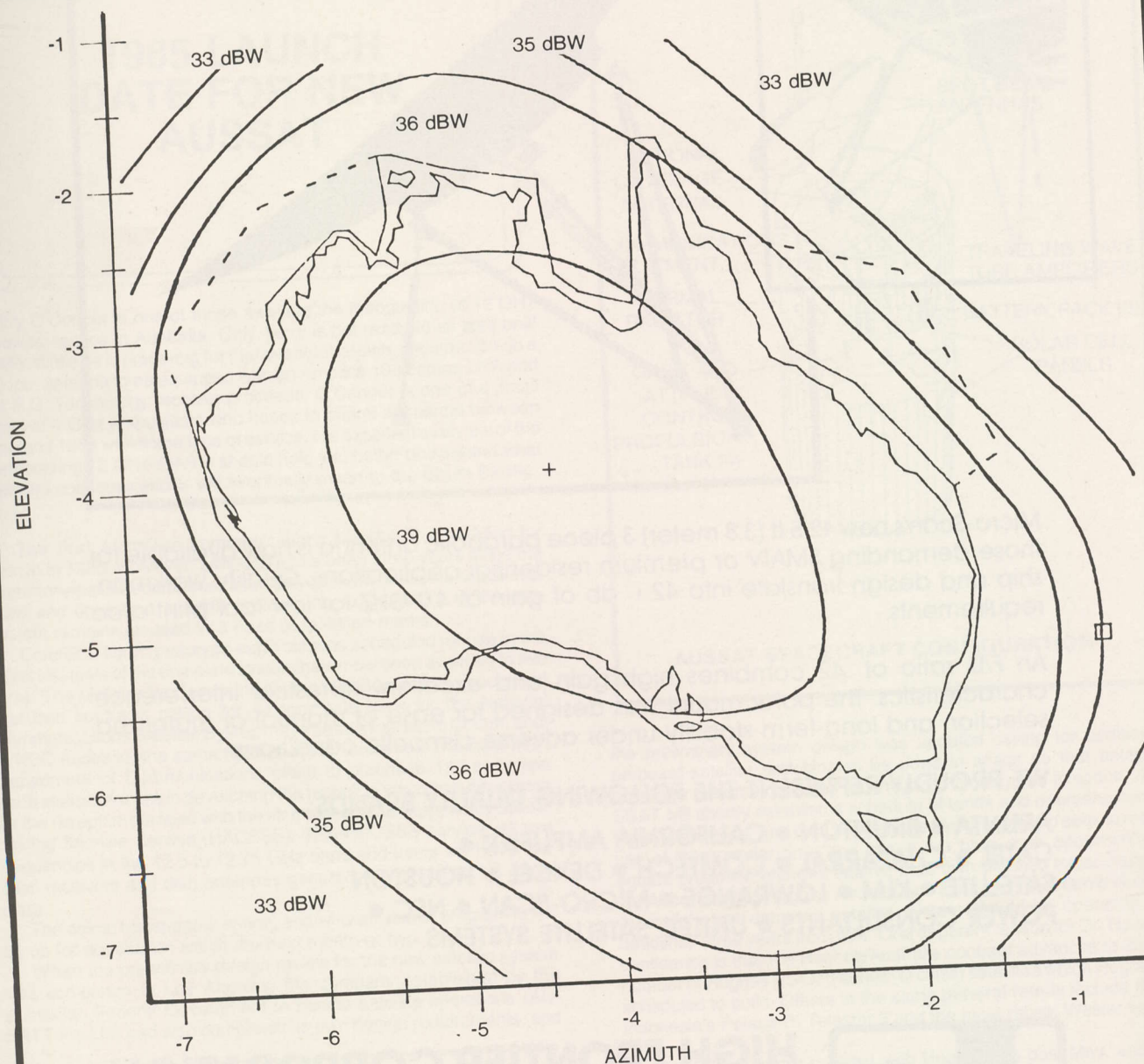
Each of the birds will have a total of eleven **12 watt** transponders and four **30 watt** transponders on board. Each will also have dual national (wide coverage) reflectors and dual spot-beam (narrow coverage) reflectors. The beams will be coverage or pattern shaped with multiple feed horn illumination transmit antennas, and by changing the antenna aperture by ground command.

The 'Southeast spot beam,' for example, will use four horns to cover all of the capital cities as well as providing a lower level signal to Perth in Western Australia. Each satellite will also have on-board back up transponder TWT configurations; a pair each of the 12 watt and 30 watt units.

Getting the new birds into orbit is one of those hazy question marks. Sometime soon they expect to announce whether they will use Ariane, the USA Space Shuttle, or a Delta launch vehicle. The selection of Ariane would allow a greater mass which translates to additional on board station keeping fuel and potentially a longer operational life.

The 12 watt transponders and the national beam combination will serve the more expensive and elaborate ground stations which will be used for the exchange of computer, national network sound and video traffic as well as aircraft communications and flight data by the Federal Department of Aviation.

The satellites, as noted, can be reconfigured while in operation with onboard switching. As many as nine of the 12 watt transponders



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on each satellite can be placed into a 'split beam' coverage mode; three for the Southeast beam, two each for the Northeast, Central and Western beams. The system will also have the ability to allow three of the higher power 30 watt transponders to operate with the National beam antennas.

Outside of Australia proper, there will be three transponders with spot beam coverage to Papua New Guinea (two low power and one high power).

With both satellites operational (the third acquired will be in 'spare' service) AUSSAT may switch sufficient of the 12 watt transponders to spot beam configuration for the three national television networks. One of the question marks remaining is the amount of television traffic to actually end up on satellite; of course the greater the percentage of traffic for television, the higher the shared cost to be borne by the television system operators.

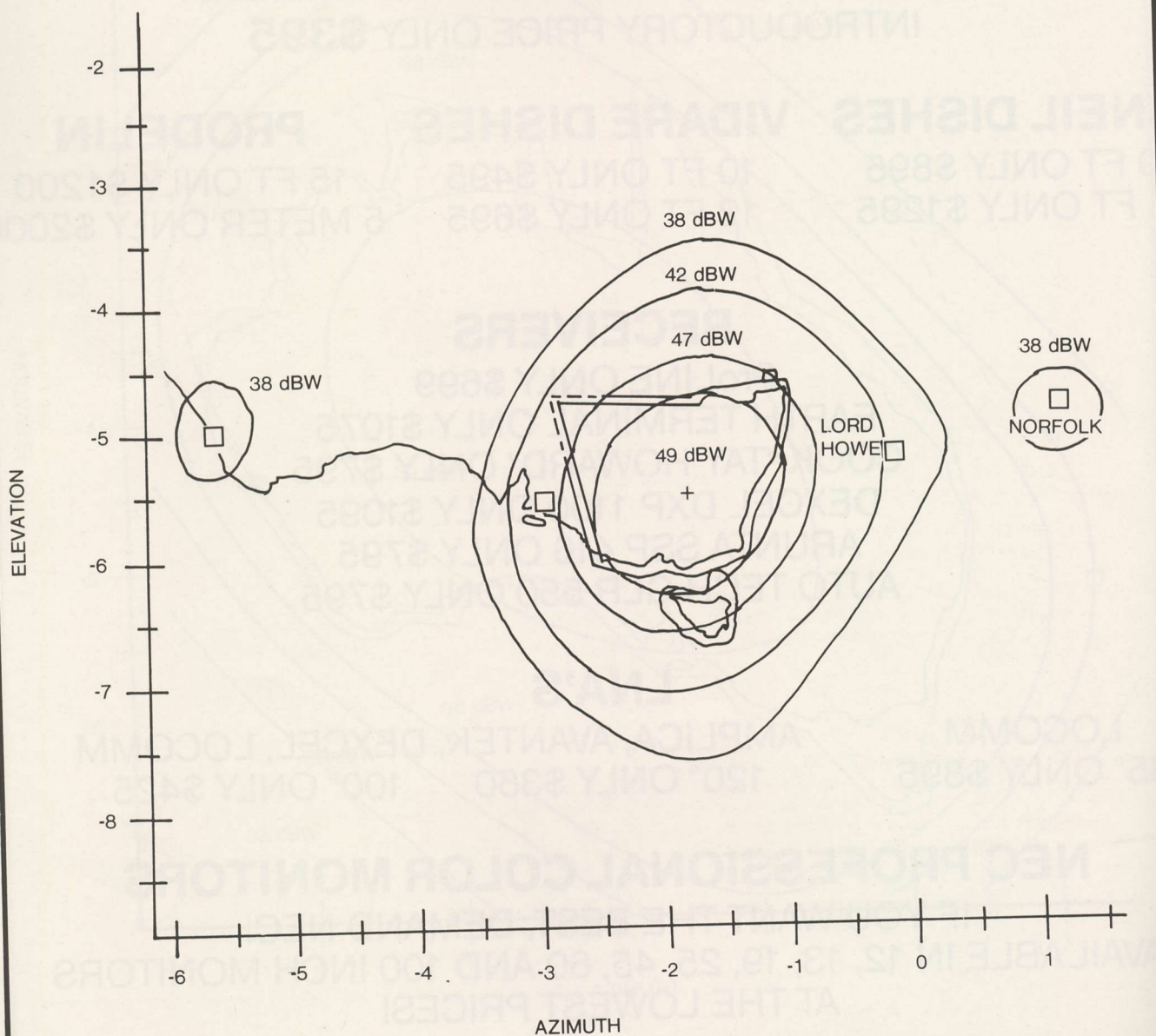
Using a 12 watt transponder in a spot beam configuration, plans

call for relatively low cost ground terminals to be associated with the networking of television programming throughout the country. It is **unlikely** that this service will be sufficiently strong, however, for **low cost** TVROs to function in anything approaching a 'DBS' class of service.

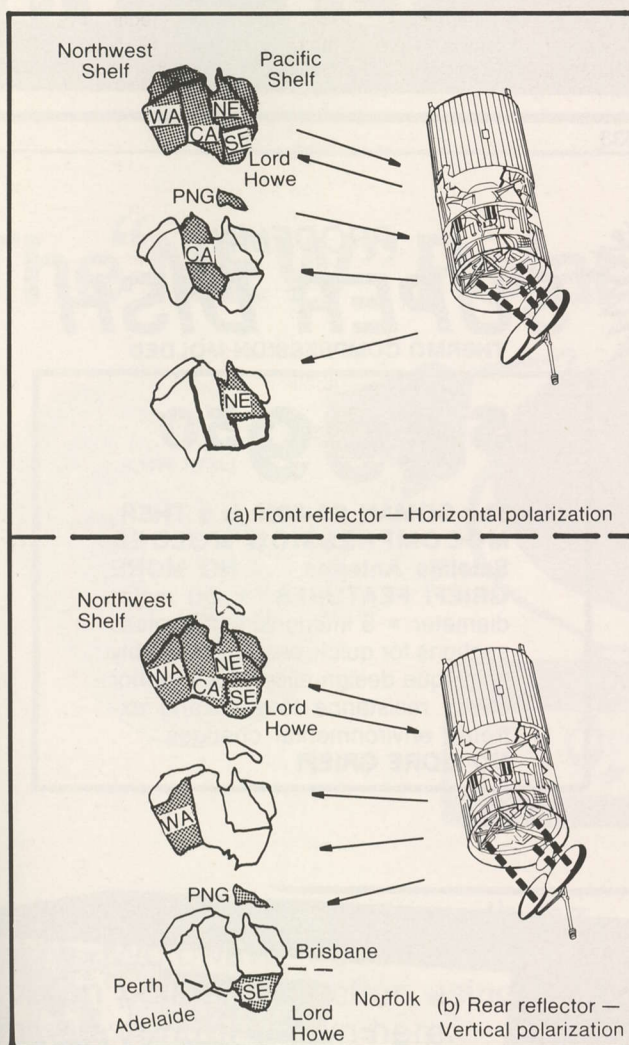
It is planned that a 30 watt spot beam, on the other hand, will provide approximately a 47 dBW EIRP within the boresight of the spotbeam and this in turn would allow antenna systems in the 1.2 to 1.5 metre region to operate. Projected cost of such 'DBS' type terminals is \$1000 (US) each.

When a 12 watt transponder is on a spotbeam configuration, the EIRP will be 42 (dBW) at boresight. This will require 3 metre class antennas for private reception of reasonable quality, while a rebroadcast application demanding higher SNR would require a 4.2 metre antenna.

In the National beam configuration, a 30 watt transponder will



SOUTH EAST BEAM HACBSS EIRP (160 DEG)



have a spotbeam EIRP of 39 dBw; while a 12 watt transponder will come in at 36 dBw. With **current** receiver system technology, the latter case suggests an antenna in the 11 metre class for high quality video and data transfer. This size and type of terminal, equipped for both transmit **and** receive, is expected to cost around \$0.7M (US).

The ability to switch between transponders and antenna feeds on board the satellites will add substantial flexibility to the services while in orbit. This switching system was developed late in the game plan, and it reflects the confidence of AUSSAT that demand for the services will be high. The extra weight of the switching and antenna systems could mean that the birds will have to trade that weight for a lower quantity of on board station keeping fuel. Since station keeping fuel translates to lifetime, the net result (short of adapting to Ariane launch) is that the birds are expected to perform for seven years.

If the Federal Government does not grant the second HACBS channel to one or more commercial groups, there is already another alternative developing for its use. An ad hoc group calling itself SAT USERS has formed, and they are seeking government approval for the transmission of teaching courses, public broadcasting, video training and instructional program transmissions. A submission has been prepared and is in the hands of the Department of Communications. Members of the police, library, banking, tertiary and adult education communities are involved in this effort.

Another recommendation under active consideration is a central 'booking agency' which would handle the scheduling and contracting for time and space for 'small users' who have limited, short term needs for transponder space. This proposal has the backing of SAT USERS as well as PBAA and Television Australia Satellite Services

DRIVING A POLAR MOUNT

READER CONTEST — CSD's 'contest' which encourages readers to submit articles for publication continues. The winner of the first year competition will be awarded an all expense paid week long trip to the Turks and Caicos Islands (starting from Fort Lauderdale), staying at the fabled **Island Princess Hotel** on the north beach of Provo. Reader Shogren brings us a treatment of basic considerations affecting any designer, seller or user of polar mount drive mechanisms. You may be working too hard to get your dish(es) to move! Oh yes, **any reader** may submit material for publication in this contest, and each article chosen for publication automatically results in the writer receiving a one-year subscription to **CSD** or an extension of an existing subscription.

In our business, we frequently receive a great deal of feedback (yes — some bad) from customers and dealers in the field concerning antenna mount design. The AZ/EL mount is slowly but surely fading into oblivion as more and more TVRO fans realize that you don't necessarily 'double your pleasure' with two handcranks! And, these same fans have also realized that it only costs half as much to motorize a polar mount as it does an AZ/EL type. So it is, that most of our feedback is directed at the polar mount antenna — and more specifically as it relates to polar axis rotation.

Needless to say, not all polar mount antennas are created equal. Some can be rotated (manually) with a minimum of effort, while others require considerable torque to get the job done. Some antennas can be rotated comfortably throughout 85% of the arc only, and may be difficult to rotate either at the beginning or at the end of the visible orbit belt. The ease of rotation may not be that significant if the user never intends to motorize his mount. In the majority of cases, however, the same guy who opts for a polar mount antenna will soon get tired of running outside to crank it and will also opt for a motor drive system.

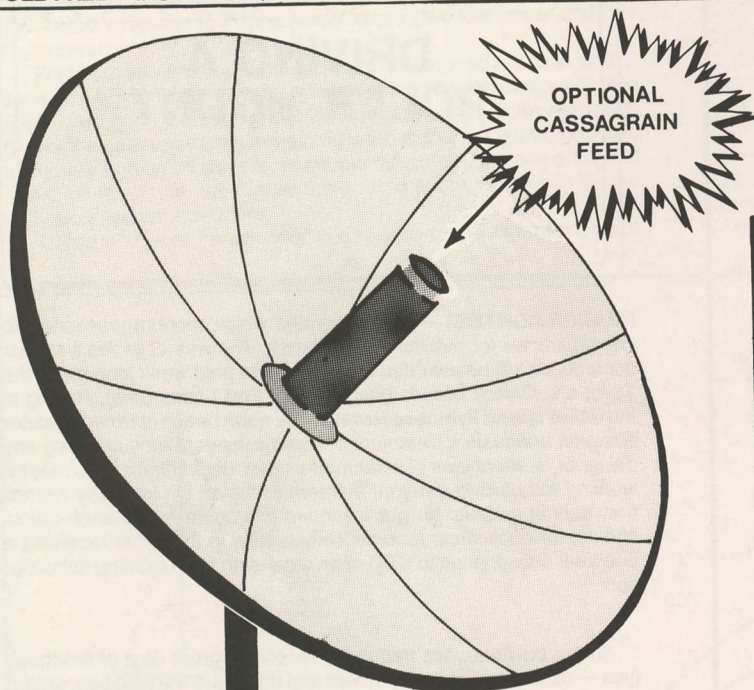
In reviewing several of the various types of mount designs available, we have discovered that a significant number of manufacturers simply do not build an **efficient** polar mount. This is to say that there are several antenna mounts, presently on the market, that require oversize motor drive systems primarily because the design engineer did **not apply** a few basic rules of simple geometry to the original design. Let's face it; the common screw (inclined plane) has been around for quite a while, and there is no magic surrounding the power that such a simple machine can wield. A typical screwjack, for example, with an 8-pitch leadscrew has a theoretical lift capacity of over 2400 lbs. (disregarding the co-efficient of friction), when the applied torque is only 4 ft./lbs. Yet **some** 10-13 foot antennas require in excess of 15 ft./lbs. of torque to accomplish the task! This 'lack of efficiency' is due primarily to excess friction and improper positioning of the actuator (or screwjack) on the mount; the latter being more

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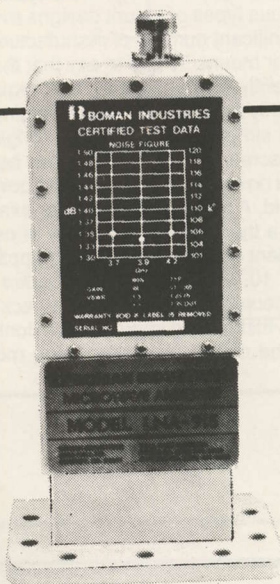
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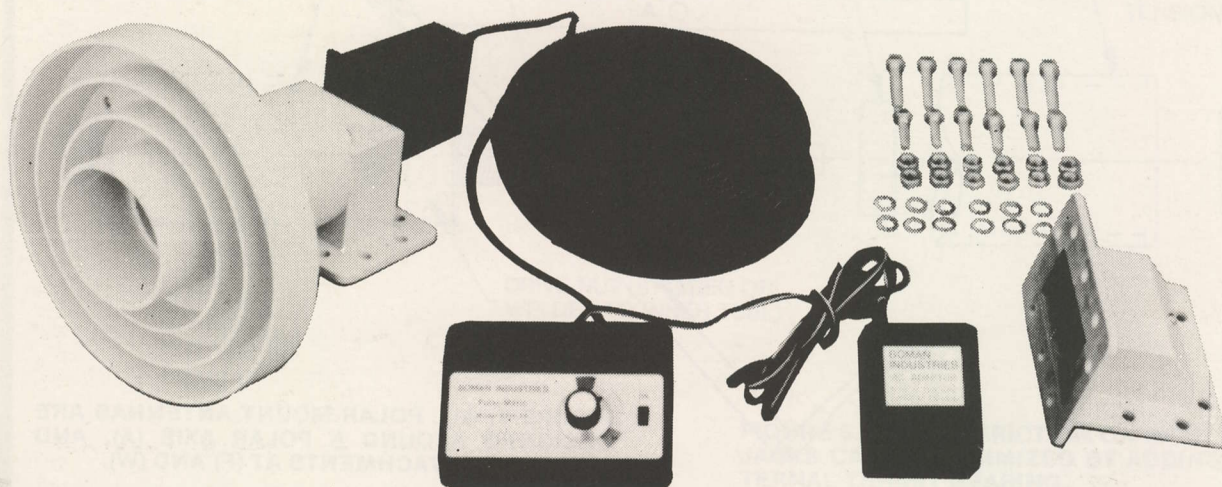
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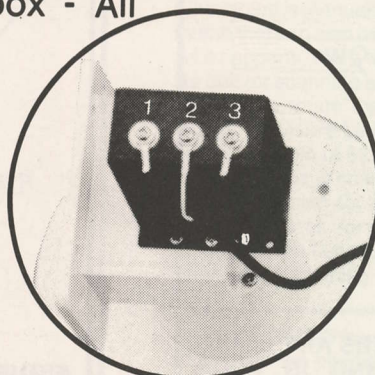


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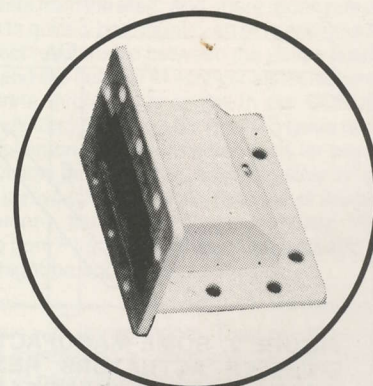
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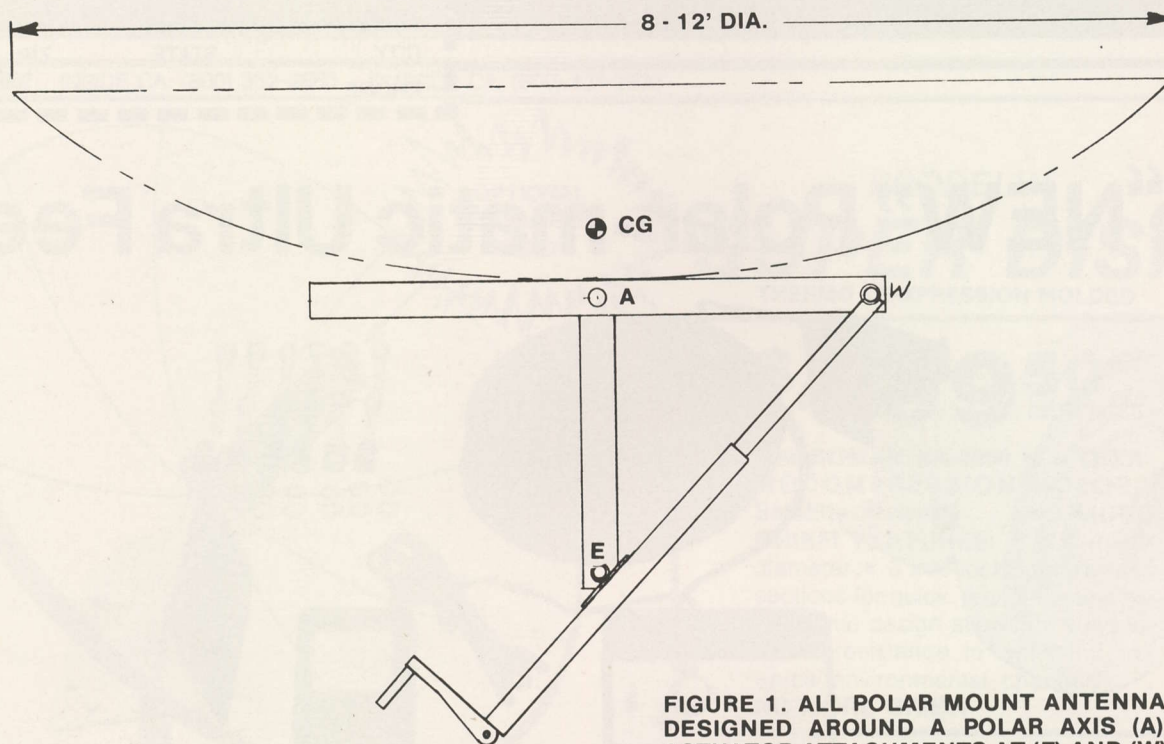


FIGURE 1. ALL POLAR MOUNT ANTENNAS ARE DESIGNED AROUND A POLAR AXIS (A), AND ACTUATOR ATTACHMENTS AT (F) AND (W).

prevalent.

Figure 1 shows the principle parts of a typical polar mount where A is the polar axis, F is the (fixed) attach point of the actuator to the mount, and W is the (movable) attach point of the actuator to the window frame. There are variations of course in attaching hardware and the relative plane of attachment, but all polar mounts have these three points (A, F and W) in common.

One of the more common errors made by today's manufacturers is the use of an actuator having a very short stroke (4-8 inches). The shorter stroke length requires a very close coupling distance between the pivot axis and the actuator; i.e., the distance A-F and A-W may be only 4-8 inches long (see Figure 2). This close coupling distance becomes more of a problem as the antenna CG (center of gravity) shifts to one side in rotation; sometimes well beyond attach point W. As a general rule, the distances A-F and A-W should never be less than 10 inches on a 3 meter antenna, with 12 to 14 inches

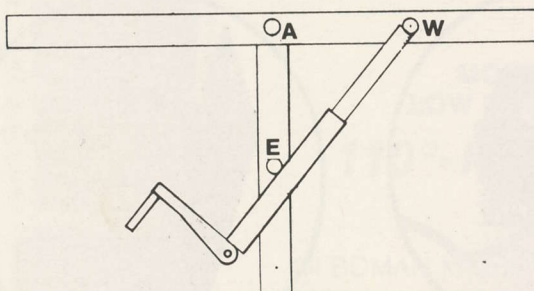


FIGURE 2. SOME MANUFACTURERS ARE USING SHORTER ACTUATORS RESULTING IN POOR MECHANICAL EFFICIENCY AND HIGHER TORQUE REQUIREMENTS.

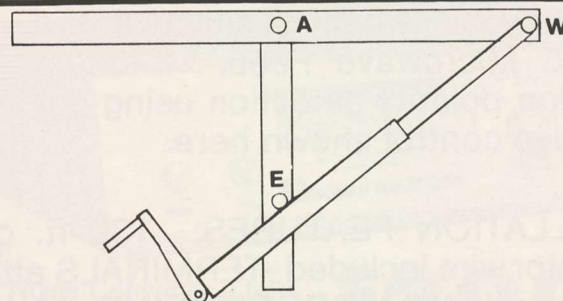


FIGURE 3. UNEQUAL COUPLING LENGTHS A-F, A-W CAN PROVIDE OPTIMUM EFFICIENCY FOR SOME GEOGRAPHICAL LOCATIONS.

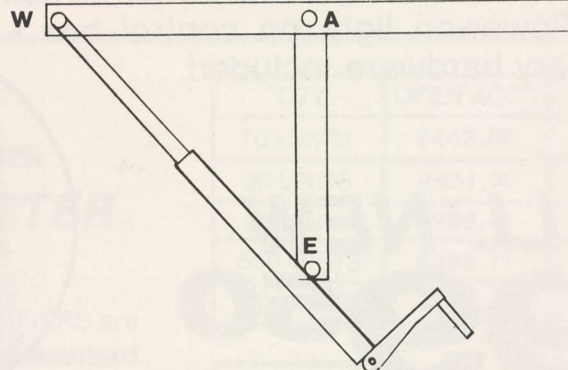


FIGURE 4. WEST COAST INSTALLATIONS CAN INCREASE EFFICIENCY BY RELOCATING THE ACTUATOR TO L.H. SIDE.

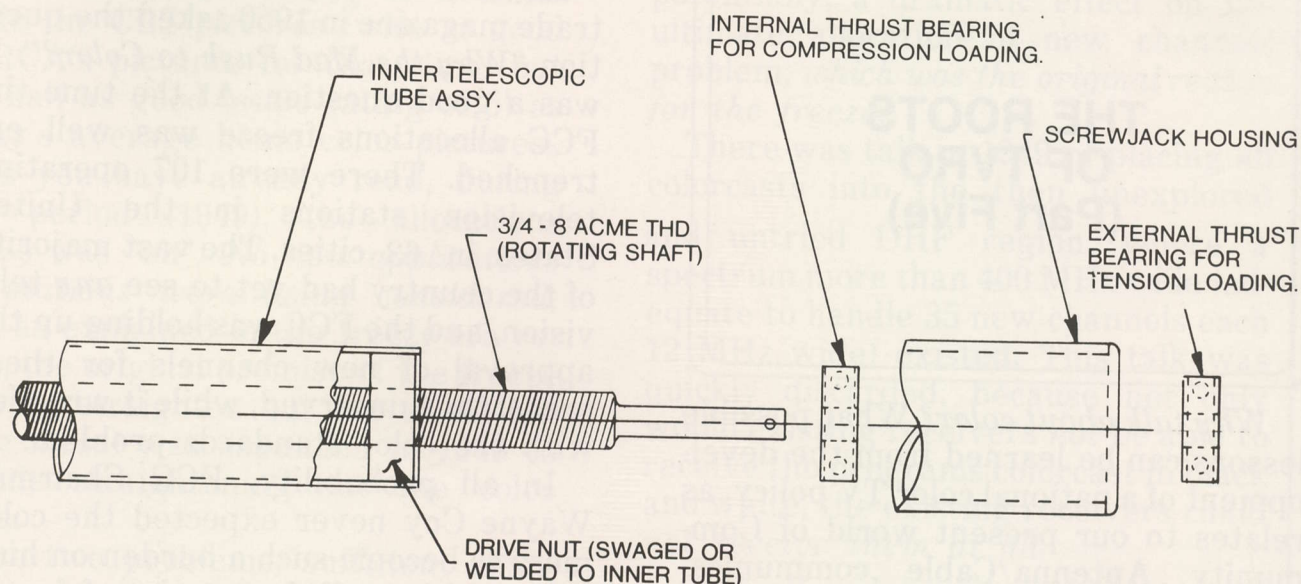


FIGURE 5. EXCESS FRICTION ON MOST SCREW-JACKS CAN BE MINIMIZED BY ADDING AN EXTERNAL THRUST BEARING.

being desirable. The stroke length should be 8 to 14 inches for optimum efficiency.

East coast TVRO owners and manufacturers have found that better efficiency can be had by increasing the distance A-W. Such a change provides increased leverage when lifting the antenna from a low look angle (Figure 3). This uneven coupling ratio becomes detrimental, however, for a mount located in the midwest portion of the CONUS. The look angle for Satcom F4 in this region is east of due south. When the antenna drops 'over center,' the center of gravity shifts over center also, resulting in additional torque to 'pull' the antenna back west. Moreover, most screwjacks are designed for applications that 'compress' the telescopic tube assemblies. A ball bearing located at the base of the actuator reduces the friction of rotation under compression loading. This bearing is typically referred

to as a **thrust bearing**. Excess friction during retraction from an 'over center' condition can be minimized by installing a similar thrust bearing on the external base of the actuator (Figure 5).

While attach points (A), (F), and (W) are geometrically important to the design of an efficient mount, they are also mechanically important. All three points are bearing surfaces that will directly affect the relative ease (or difficulty) of polar rotation as well as the stability of the antenna. The use of poorly designed bearings, or bearing surfaces at any one of these locations, can greatly affect a stable picture during windy conditions. The best test for antenna stability is 3 or 4 good tugs at the edge of the dish. If it gives more than 1/2", look for loose or cheap bearings at the primary attach points. Some antenna manufacturers are now using heavy duty sealed ball bearings for the polar axis; a sign of much needed design improvement.

Today's dealers and distributors recognize the high probability that a customer will eventually want a motorized antenna mount. Adding a motorized drive after the initial installation is not that difficult if the mount is manually efficient from the start. And, there is one rule of thumb that can also be used to quickly help identify an efficient mount. As it happens, there is a direct relationship between the visible satellite belt (or scanning angle) and the number of screwshaft revolutions required to rotate the antenna through this angle. In the CONUS region, the visible belt extends from 83°W to 135°W which gives us a scanning angle of 52°. The optimum number of revolutions for any 3 meter antenna to scan this visible belt is 100; or, approximately 1/2° of antenna rotation for every screwjack revolution. The rule of thumb then, is to look for an antenna that requires approximately 100 actuator revolutions to move from F1 to F4. Anything more than 100 is good, while anything less might be considered inefficient.

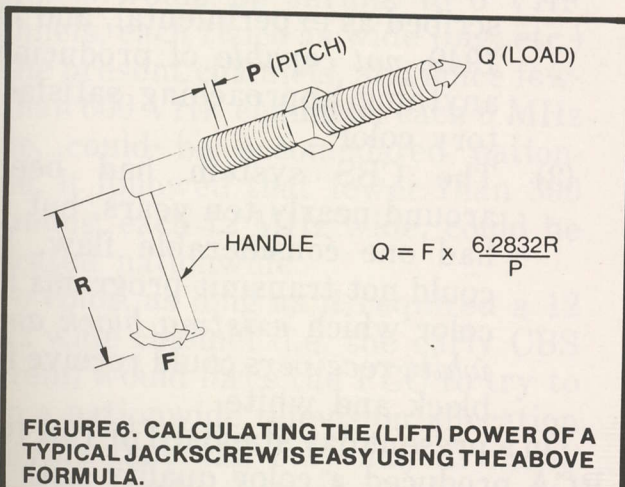


FIGURE 6. CALCULATING THE (LIFT) POWER OF A TYPICAL JACKSCREW IS EASY USING THE ABOVE FORMULA.

PRICE WARS have begun with transponders. They are already so low that we all might get together as a group and rent one. For example, you can now rent a 24 hour video transponder on F2 or F1 for a paltry \$75,900 per month. Or, over on F4, you can move up to F4 for \$150,000 for 30 days.

THE ROOTS OF TVRO (Part Five)

Why talk about color? What possible lessons can be learned from the development of a national color TV policy, as relates to our present world of Community Antenna/Cable communications?

Simply put, the manner in which the Commission handled the establishment of a national color TV policy illustrates, perhaps even better than the subsequent handling of the UHF fiasco, how many grave errors a federal agency can make, *and still stay in business*. Those who believe "right will prevail" or that "the issue(s) will be settled on the merits" probably will have their bubble burst after reading this chronology. In this report, you can almost feel the "electricity" that existed between the two giants CBS and RCA, and one wonders how RCA representatives managed to "keep their cool" when Commission decision after decision went against them. In spite of our concern about their power positions *today*, we have to admire RCA's virtually complete control over their tempers

This series appears in **CSD** from a pair of issues of **CATJ**, The Community Antenna Television Journal, published in 1975. In this Coop created **CATJ** series, the early history of television broadcasting in the United States was traced to provide a 'record for Congress' of FCC actions and inactions which led, ultimately, to the television network broadcasting system that grew in America between 1946 and 1975. Through this continuing series, **CSD** readers are given the opportunity to better understand the foundation for today's explosive satellite industry growth.

in the crazy years 1949-1951.

An editorial appearing in a popular trade magazine in 1950 asked the question "*Why the Mad Rush to Color?*". It was a good question. At the time the FCC allocations freeze was well entrenched. There were 107 operating television stations in the United States, in 63 cities. The vast majority of the country had yet to see *any* television, and the FCC was holding up the approval of new channels for these areas, then unserved, while it wrestled with the color standards problem.

In all probability, FCC Chairman Wayne Coy never expected the color mess to become such a burden on himself and his staff. In complete fairness to the Chairman, the Commission was under the blustery and frequent attacks of Colorado Senator Edward Johnson who constantly badgered the Commission to approve color (new channels, etc.) *yesterday*.

Not Compatible

To understand fully the complexity of the color issues to follow, you must understand that in 1949, when color studies began:

- (1) There were two proponents of systems, CBS and RCA;
- (2) The RCA system was best described as experimental, and in 1949, *not capable* of producing anything approaching satisfactory color;
- (3) The CBS system had been around nearly ten years, but it had one considerable flaw. It could not transmit programs in color which *existing black and white receivers* could receive in black and white.

On a present day standard of 1 to 10, RCA produced a color quality with a

scale rating of 2 and CBS produced color with a scale rating of 4, which made the CBS pictures twice as good as RCA's pictures for that time, but not half as good (scale rating of 5) as today's average home color pictures.

As you have already read, during this period (1949), the allocations freeze was "on". *No new applications for stations were being considered*, and, as explained in the freeze-era report, the original premise of the freeze (how to straighten out the allocation table mess) was *expanded* in 1949 to include straightening out the color mess.

The two problems, sufficient channels and approving a national set of color technical standards, interwove because the original CBS "sequential field" color system would not fit into the then (and now) standard 6 MHz wide channel assignment. In fact, to produce *acceptable* (scale rating of 6) color, the CBS system required a channel 12 MHz wide. This is another way of saying that *had that particular color format prevailed*, today we would have *half* as many channels (each *twice* as wide in frequency spectrum) as we have today. Or to put it into 1949 vernacular, the then operating 12 VHF channels would be shrunk to 6 VHF channels, each twice as wide (big, etc.) as the present channels, and since fewer than 600 VHF channels, each 6 MHz wide, could be accommodated nationwide, it followed that fewer than 300 channels, each 12 MHz wide, could be allocated nationwide.

So color, as long as it required a 12 MHz wide channel (i.e. the early CBS system) would force the FCC to try to plan a nationwide television allocation program that had only *half as many channels* and channel assignments

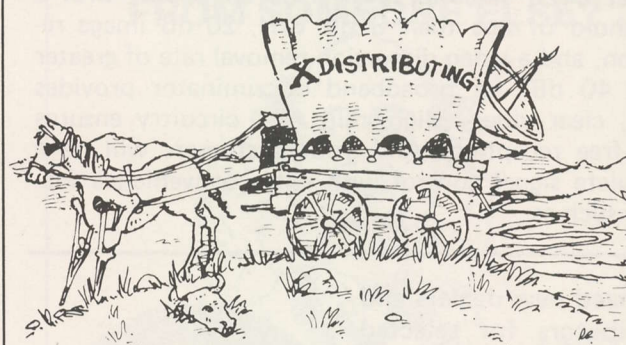
available as we have today. This had, potentially, a dramatic effect on the ultimate allocation of new channels problem, *which was the original reason for the freeze*.

There was talk in 1949 of placing all colorcasts into the then unexplored and untried UHF region, where a spectrum more than 400 MHz wide (adequate to handle 35 new channels each 12 MHz wide) existed. This talk was quickly discarded, because not only would existing receivers *not* be able to receive the programs colorcast in black and white, the existing receivers *could not receive them at all*.

CBS offered to solve the problem, with a "slight reduction" in color quality, and the battle began.

SERIES CONTINUES / January 1983

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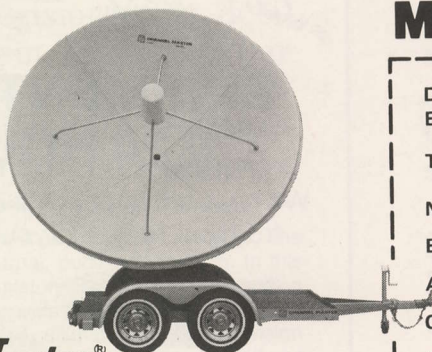
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ANGRY WITH COOP

Your comments in the August issue of CSD regarding the Boman Company, and, Company 'H' set some kind of new substandard. A publication which occupies a position of influence such as yours should stick to the facts as personally ascertained and not render a disservice to its readers by reporting hearsay.

My experience with the Boman Company is 180 degrees out of phase with your report. During my first contact with this company, I talked with Ms. Karni Scott who was extremely knowledgeable and helpful. Ms. Scott has since proved to be candid and truthful by following up with the information promised. Which, I might say, is more than some of the other advertisers in CSD have done for me!

As one who makes a living by evaluating consumer products, I question the validity of knowledge gained by examination of a product when the supplier is aware that a favorable conclusion could result in sales. Any request for a 'freebie' or evaluation is and should be viewed with extreme skepticism. If you will recall the early days of television, you will remember 'Madman Earl Muntz.' His sets were 'gutless wonders' but, were also something of an engineering marvel. His advertising was lurid, but effective. He sold a hell of a lot of TV sets!

While 100 percent truth in advertising is as scarce as can be, one very good way to go out of business is to advertise an inferior product. As for the 'H' company, if you are going to castigate a company or an individual, don't hide behind free speech and press amendments. Do it eyeball to eyeball! The good old boys at company 'H' could give us all a few lessons in engineering and marketing. To categorically refute the statements made in print by company 'H' while basing your conclusions on hearsay is unconscionable. If you know that company 'H' is misrepresenting their product, then blow the whistle on them!

John H. Rutledge
Michael's Cove
Mabank, TX. 75147

Boman's case probably does not require re-hashing here since subsequent to your letter we published an 'eyeball to eyeball' interview with Boman's Robert Maniaci (see CSD, October 1982), and, commented on an attempt to get us to reword that interview, after the fact, in our November 1982 issue. Boman, for now, has been worked to death. As for the company 'H' antenna, it should surprise no-one that 'H' stands for Harris. Our sources were inside of Harris; to identify them would have cost one or more of them their jobs. That is not hiding behind First Amendment rights; it is just being decent. These chaps felt very upset that their company had engaged in the type of pre-product release advertising which their Delta Gain antenna got, and they were further upset that a company of their 'stature' was stooping to buying editorial favors in publications such as SatGuide by giving away junkets to publishers. Now subsequent to that 'Comment' here in CSD, somebody (not Harris) made arrangements for us to get our hands on a Delta Gain antenna. It is now on Provo and we will be testing it very extensively over the next month or more. When we are done, we'll tell you what we found. Recall however that the first published data told us it would work as well as a 4.5 meter prime focus antenna. We don't want to pre-judge their ten foot antenna, but that works out to better than 100% efficiency. Yes, Harris can teach us a few things about marketing

and engineering. I'd like somebody to show me how to get 110% efficiency out of a dish!

Practical NCTA/RCA/F4 Use

I read with interest your coverage of RCA's F4 bird as it was used by RCA at their booth at the NCTA Convention in Las Vegas, this year. On the last day of the show I took some advantage of that camera and their transponder 23 'service'. I set upon holding a personal teleconference! After making a dozen telephone calls back to home in Southern California, I finally got Bob Luly and the gang at San Bernadino to set up on F4. Not really being prepared, I remembered that I had some photos of the reception using Bob Luly's little four footer at Fort Worth this past spring. So I pulled them out and Fred Fourcher of Miralite zoomed in and got a clear focus. At the same time I 'plugged' that these were pictures off of a four footer, taken at a private terminal convention, and I of course mentioned who made the equipment for

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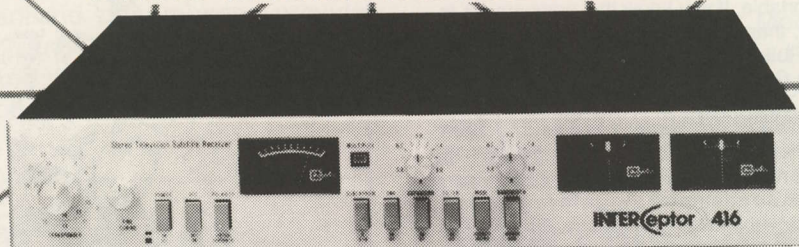
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this system. (Mr. Luly of course!).

In all honesty, I could see that the RCA folks manning the booth were quite apprehensive over what I was doing although they did enjoy it. I wished I had used their satellite model to do a little lecture on the technology of satellites! Before that stop, I did get a first hand tour of the up and downlink trailer set up by TBN.

Steve Crowe
Satellite Television Consultant
P.O. Box 74874
Los Angeles, Ca. 90004

Love it! Serves RCA right. Since RCA was hurting for booth activity and the 'see yourself on satellite' uplink ploy didn't attract that much interest, maybe if they do it again we can all be prepared for an 'impromptu' special feed next time.

Embarrassed

Needless to say, we were embarrassed to read in **CSD** that one of our customers had not been receiving his magazines. The gal that handled his correspondence failed to follow through and take care of the complaint. We have mailed to him, first class mail, the last two issues, and are starting his subscription from that point. We are also enclosing copies of our last two issues for your own information. As you may realize, it is difficult to publish a magazine with fewer than 250 subscribers and few or no advertisements.

I am very concerned with the recent explosion in firms offering to put people into the Television broadcasting (low power TV) business. Some of these advertisements sell \$4,000 license application packages, painting the \$4,000 investment as a token towards the grant of licenses worth millions. I have inspected many of these applications, and they appear to have been mimeographed! I am preparing for publication in our own magazine an article titled 'The Low Power TV Ripoff'. People need to be warned.

Harlan L. Jacobsen
Lo-Power Television
7432 E. Diamond
Scottsdale, Az. 85257

An earlier issue of **CSD** carried a letter from a subscriber who wanted assistance in running down a missing subscription to Harlan's Low Power TV Magazine. He got it. Harlan is dead right; because of the tragic, bungling way the FCC has handled low power TV license applications, and the absurd procedures established by the FCC for processing those applications, the whole low power TV thing has turned into a giant boon doggie. We are not surprised to see opportunists jumping in with \$4,000 get-rich licensing schemes. The truth is that only those preparing such licenses are apt to get rich. We had great hope for the marriage of low cost TVROs and low cost, low-power television broadcasting. But no more. The FCC has screwed this one up so badly it will take an act of Congress to set it right again. Our suggestion is that they return each and every of the 7,000 or so plus applications now on file, adopt some hard rules for LPTV, and having done that, create a new, simplified, automatic go / no-go license processing procedure. There comes a time when the best thing you can do with a really dirty mess is to walk away from it and start all over. The FCC bankrupted this one. It is time they admitted their mistake and started with a clean slate. As for Harlan's magazine effort, we like it. Harlan is enthusiastic, he writes with an honest pen, and he is trying. Anyone seriously interested in ever getting into LPTV should support his publication because at the moment he is the only guy out there trying to find a sensible solution to the FCC created mess.

THE OTHER SIDE OF THE LEMON

I was very disappointed to see you print in **CSD** comments about an incident that occurred in Omaha, without first checking the facts with us.

The incident first began a few days prior to the SPACE show in August when Jerry Brandt called our plant and verbally assaulted our secretary. He said he had two receivers that did not work. After he calmed down, we told him he could bring his units to the show and we would look at them for him, there. He agreed. The receivers were purchased in 1981 for about \$500 each.

At the show, he came by our booth and insisted on immediate

action. We disconnected our demonstration receiver (while several customers were present) and put both of his units on line. They worked great. He was amazed (obviously he had not been hooking them up properly), but still insisted that we return his money or give him two of our latest models. He claimed his receivers were never used, but they showed signs of wear and tear and had obviously been in use. One had been returned to us several months prior for repair, and had been damaged by applying improper voltages to the down converter.

Well, it turns out that Jerry Brandt never did register for the SPACE show, somehow got in without paying, and presented an extremely poor image for himself. He went out into the lobby and created a general nuisance for the whole SPACE staff. He finally left when 'The Enforcer' made him an offer which he could not refuse.

I would like to point out that our products carry a one year factory warranty, including updating older model receivers to current performance levels; something which most of our competitors do not do. The model 1240 receiver that we provided to **CSD** at the Fort Worth show was tested thoroughly at our factory. I wished you had notified us when you were evaluating the unit. This model has a 50 ohm impedance and it will have problems when connected to a 75 ohm line.

I wish you had checked with us before you published the story in **CSD**. I would appreciate a retraction in an early issue of **CSD**. The industry is entitled to know exactly what happened and the actual comments and events that did occur. We have always tried to enhance the professionalism of the industry, and we intend to continue to keep Telecom at the leading edge of this new and exciting industry.

Jim Bertonis
President
Telecom Industries Corporation
27 Bonaventure Drive
San Jose, Ca. 95134

We also received a detailed letter from former Telecom employee Andy Gibbs on this incident, and Gibbs points out that Brandt is alleged to have tried duplexing down converter operating voltage up the line to the down converter, thereby rendering it

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useless in a poof of smoke. Gibbs also advises that a pair of replacement receivers, for Jerry Brandt, are in transit to Brandt via the CSD office. We have been given Telecom's permission to evaluate the two units before turning them over to Brandt and we will do so, using the Telecom unit supplied directly to us last March as a comparison 'standard.' We did talk with several people who witnessed the incident in Omaha, Jim, and this is one of those strange cases where everyone who saw it, and we talked to, has a different view of what was said, what happened, who was the bad guy and who was the nice guy. Most agree Brandt was so angered that he did say some unpleasant things. But as the following letter notes, given the same circumstances, who can say how any of us might have acted?

FOLLOW THE BOUNCING LEMON

This note concerns your comment entitled 'Lemons For Sale' appearing in the October issue of CSD. I, too, had and still have a similar tale to tell about a Telecom receiver. I purchased the unit from a wholesaler that represented himself as an 'unlisted investor' in Telecom. Due to a variety of circumstances, the unit in question was picked up from source and installed the very same day. At three in the morning, my installers got back to the shop; they should have returned seven hours prior to that for a 'normal' installation! At 10 that same day the customer called to say the system was down. The installers went back and had to replace the Telecom receiver. The trip was over 100 miles, each way. We replaced the ailing receiver with another brand of unit and took the Telecom back to the wholesaler whom we had purchased it from. We wanted it repaired or replaced. He told me he would have 'nothing further to do with it' since, as he explained, "I have already made my profit on that sale." This outfit continues to this day to publish full page advertisements in CSD and Satellite TV Week.

I then called Telecom and talked with Andy Gibbs. He told me that they would repair or upgrade the unit for a fee; **so much for the warranty!** The unit was sent to them and subsequently returned to us. When the receiver came back, we found it could not be used in an installation because it exhibited very erratic performance. Now, much later, I find that the only two people I ever had contact with at Telecom, Andy Gibbs and Vincent Finelli, have jumped the Telecom ship. To anticipate a question, I **did** act promptly, and all of this took place in less than a month. All of the satisfaction I have is a piece of junk sitting on a shelf which somebody calls a TVRO receiver. The manufacturer and the wholesaler have done **nothing** to correct the problem since this past January. To a small dealer, the good faith purchase that turns out to be a real lemon is a major drain on the working capital of a business. This is especially true when the competition around me is selling complete systems for as low as \$1795 to \$1995!

If I had really been aware of what was happening, and had the foresight, I too would have joined Jerry Brandt in Omaha with his designed-to-get-attention-grabber. **I was a witness to his frustration** when he presented his case to SPACE's Rick Brown prior to one seminar.

As a maturing industry, we must have some ethical standards to live by, or we will be wiped right out of the business world by punitive legislation.

As a newly elected member of the Board of Directors for SPACE, I hope to present some standards (both business and technical) that will enable honest dealers and honest manufacturers to sell and market quality products. I know that CSD does get equipment to test, and I know that some of that equipment ends up in a sand pile on Provo. I believe that CSD would best serve the industry, especially the small dealers who do not have the capital to go about buying new units and **then discovering** they have a lemon on their hands, and often no way to get their money back, if CSD would let us know **which** units test out badly as well as those that 'pass.' We dealers need to know the truth if the industry is to survive.

Dan W. Weggeland
Instructional Media Associates
7763 Buckboard Trail
Palo Cedro, Ca. 96073

First we are delighted that members of SPACE had the foresight to vote you onto the Board, Dan! Your head is screwed on

straight and if a few more members of the board will get up there and argue with you, we might get some industry standards through SPACE in the coming year. As for testing equipment, we have been faulted (and perhaps rightfully so) because we accept donated equipment for test. We have always felt that we were smart enough to spot a unit that had been doctored, or which operated uncommonly well, and to take that into consideration when we did a review. But the truth is that it is possible to fool us. So we have had our heads together with Tom Humphries, who like you, is simply a TVRO dealer now (i.e. Tom no longer has any ties with a manufacturer) and Tom will be putting together a very comprehensive equipment test and evaluation program for us. I believe that in the future, we will be doing at least one complete detailed analysis of a product per month, with lesser detailed looks at a few more, most months. In the future, we won't write about any products which we have been sent for evaluation **UNLESS** we have also gone out on our own and purchased or borrowed, without the manufacturer's knowledge, an identical unit. Then when we do a review, we will be comparing one against the other and telling you what we find. Differences between two supposedly identical units, alone, could be an interesting thing to observe. We are putting the finishing touch on this program now, and hope to announce the new ground rules in the January issue.

THIRD STAR TO THE RIGHT

I am writing to inquire about 'Big Band Music From Outer Space.' What kind of disc (dish) should one have to receive these programs? I am a novice and any information you can supply will be appreciated.

H.R. Baker
4261 Emerald Circle
Cypress, Ca. 90630

Sometimes I think I have the same problem as Ann Landers; trying to sift out the 'real letters' from those created by a group of college kids at Harvard. If this is a real letter, I must admit frankly I don't understand it. If this is a make believe letter, I must still admit that I don't understand it!

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Fullview Satellite Antenna Co.

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*In quantities of 10 or more.

SPARKLIES?

Last week (early October), mid-morning, I experienced a lot of sparklies on W4 (FNN). This week, on October 5th, at 11:09 AM, FNN started to get sparklies which lasted until 11:31 AM. When I checked the dish alignment I found I was looking 'directly into the sun (!)'. FNN was completely gone for a period of time and on my Dexcel receiver the meter went from a normal 7 to a high reading of 8 on the sparklies. There was no audio or video.

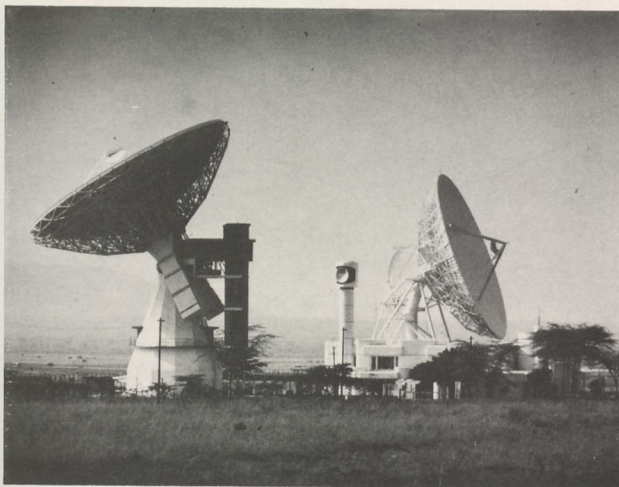
Ernest A. Bach
74920 Borrego Drive
Palm Desert, Ca. 92260

Sun outage. Every fall around the first of October, and every spring in the first week to ten days of March, the sun aligns itself with the geostationary orbit belt. When the sun is 'behind' the satellite you are watching, the 'power' of the sun drowns out the relatively weak signal from the satellite. No big deal. No solution either. And, fortunately, it only lasts for a few days and for a relatively short period each day. The satellites furthest east see this earlier in the day than those further west, for what should be obvious reasons.

EAST AND WEST

During a recent 'Safari' in Africa, my son Wayne happened upon an excellent example of a national INTELSAT terminal in Kenya, East Africa. The Mt. Longonot Telecommunications 20 Metre installation is located in the Great Rift Valley approximately 75 miles from Nairobi, Kenya. There are a pair of 20 meter INTELSAT terminals here which would appear to be directed respectively west northwest towards the Atlantic INTELSAT cluster just east of the Prime Meridian, and east northeast towards the equivalent cluster serving the Indian Ocean countries. This is the main link for telephone and television communications for East Africa.

Gordon Lawhorn
WORLDSAT
6325 Chamberlayne Rd.
Mechanicsville, Va. 23111



There is probably good reason why the terminals are located 75 miles from Nairobi, rather than close to the population center, but it escapes us. One of the reasons INTELSAT terminals end up costing so much (their size aside) is the overkill in engineering. Perhaps when the terminal was planned they worried about terrestrial interference and felt the best insurance was to place the system far from any developed areas.

HIDE IT IN SAUDI

I read with great interest a sample copy of the August CSD which I sent for and found it very informative. If I was living in CONUS (Continental United States) I would have a terminal operating next weekend! However, I am attached to the Royal Saudi Navy project in eastern Saudi Arabia and have been for three years. Local television is heavily censored, based upon local beliefs, and programs such as

'Little House On The Prairie' are even hacked up. You can imagine what happens to 'Dallas'! Oh yes, those are the 'Dallas' shows of two years back. There is obviously some sort of satellite service available in this area. So naturally I want to know what satellites, what programs, what formats, what signal levels, what size dish and so on. Can anyone help me?

The questions could be academic since I have no way of knowing how the Saudis might react if a big, white dish popped up in our 'compound.' There is a local nervousness about having certain types of modern communication devices. For example, private two-way radio is illegal; shortwave radios are illegal if they can tune in FM transmissions below 80 MHz; computer communication terminals and links require prior, complicated, government approval. I can imagine what might happen if one wanted to install a TVRO terminal to bring in uncensored materials! If I could get by with a ten foot dish, I might be able to 'conceal' it behind the back patio and my vine covered trellis!

Michael B. Roland
P.O. Box 1949
Al Khobar
Saudi Arabia

A ten footer would only produce pictures on the Indian Ocean Ghorizont bird. There are no English language programs on that Ghorizont, to the best of our knowledge, although there may be twenty hours per week on the 14 degree west Ghorizont. All of your answers are found in the new Steve Birkill 'International Satellites' book from STTI (P.O. Box G, Arcadia, Ok. 73007).

TOO LATE TO HELP?

I have been a subscriber to CSD for about 18 months. My background is in telecommunications (26 years) and presently operate a visual arts (television production) company called Sat-Tel. I plan to be visiting Australia and New Zealand this fall and would like to mix some pleasure with some business. Can you help me get in contact with people in these countries who are in the satellite communications field? I have been very pleased with the information and technical content of CSD and also found the information in your **Satellite Operations Manual** very helpful in making timely site installations.

N. Richard Farria
President
SAT-TEL, Inc.
P.O. Box 96
Finksburg, Md. 21048

Ah yes; we met at the Fort Worth show this past spring. New Zealand has no known TVRO activity other than the pair of Intelsat terminals that connect the country to the occasional sports and news feed for local television use. Australia, as we have written extensively, is discovering TVROs at this time; primarily because of the pilgrimage effort of one Taylor Howard. At the moment, the South Pacific is kind of in a 'hole' for receiving a variety of satellite programming although the islands scattered in the central Pacific are far better placed. Our June 1982 issue forecast that some service from F3R and W4 transponders could be available over a wide area of the Pacific (see page 4, CSD June '82) but to date there has been no testing done in the area to confirm or refute this theory.

SLOW MOVER

I have been taking **Coop's Satellite Digest** going onto three years now and I wanted to let you know that we finally got into the business. Enclosed is one of our brochures we handed out at the Spokane (Wn) Interstate Fair where we exhibited for nine days; from September 11 through 18. Although I have never met Coop, I feel I know him because I have read every word he has written and I get some good laughs sometimes too. I have 45 years of electronic experience behind me.

Ellsworth O. Johnson
364 Coeurdalene St.
Spokane, Wn. 99204

Johnson has been a distributor of radio and television products for a long-long time. They are now offering a line of home terminals, like so many of the 'old line' distributors in electronics. When Johnson began in 1934, we had a brand new 'Communications Act.' Now here we are fighting about how that act

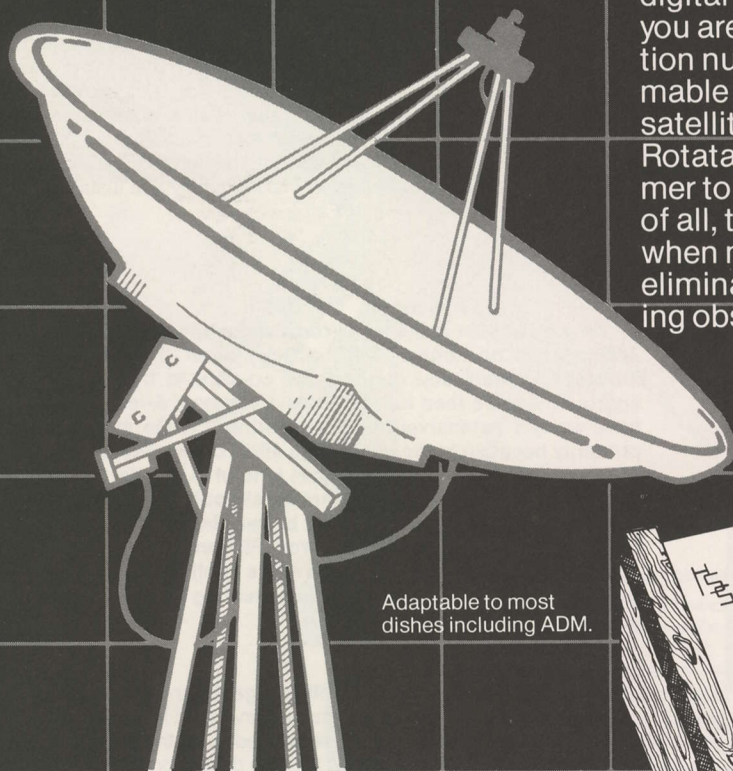
TRACKER III

SATELLITE LOCATOR

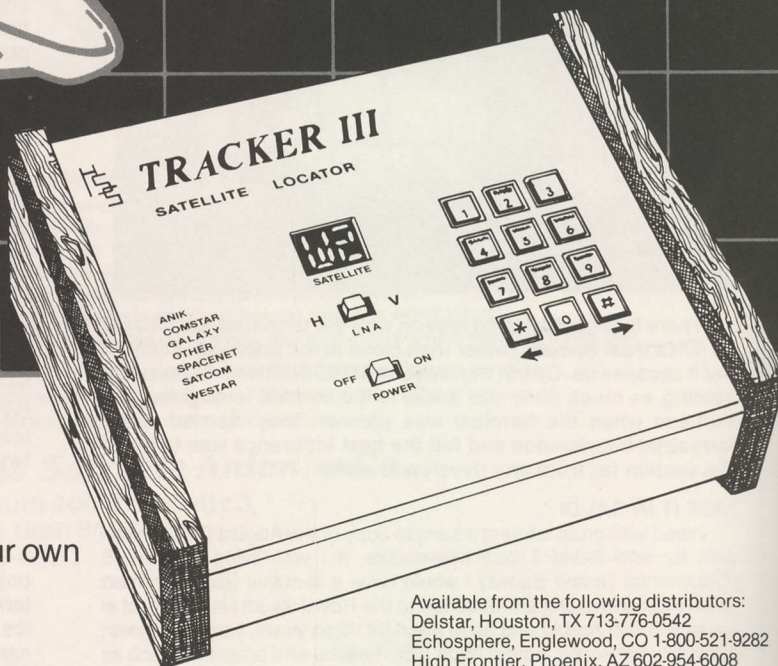
A TOUCH ABOVE THE REST

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bears on satellite TV!**HELP**

I understand you are an expert in the field of satellite television. Please help me to avoid a sure mistake when buying my TVRO. There are so many companies out there and their claims are so confusing that I do not know who or what to believe. The local cable company wants \$8,400 to hook me up since I am so far from their lines. I tried to get reception by purchasing a 'Microwave Antenna' from a firm in Las Vegas, Nv. (\$229) and that contraption doesn't even get a blip for me on the TV. My funds are limited and I don't want and cannot afford another mistake.

T. Palma, Jr.
P.O. Box 395
Holmdel, N.J. 07733

Will someone in the area try to help this fellow out? He's looking for a low end system, with reasonable good performance. I'll be checking back with him to see what help he got and how well it worked!

HELP ME WRITE A BOOK

For the past two years I have been trying to follow the evolution of the consumer satellite TVRO industry. I have read several of your excellent articles. I am seeking additional sources for more basic information, especially the fundamentals of satellite reception. I need to learn all I can about satellite communications technology, as it deals or will deal with home video and computer transmissions. Are there any manuals or textbooks available?

Andrew B. Morgavan
1426 Sandy Pass Dr.
Lake Zurich, IL 60047

Andrew seems bright enough but he needs someone to show him how a terminal works. Anyone around Lake Zurich listening?

HELP ME WRITE A BOOK: TWO

I am the manager of Audio-Video in Austin, Tx. and we subscribe to CSD. I am producing a paper/pamphlet for our customers describing satellite antenna systems for the private and commercial user. I am looking for information describing in very basic terms what a satellite terminal is, how it works, and what a person can expect to see with it. I would also like to cover the satellites in orbit, the approximate number of broadcasts a home terminal might receive, what the future might offer for retailers as well as the demand for home systems. And I would like to know the history of the legal questions surrounding any of this information.

Robert Cummins
Audio Video
13311 Wisterwood
Round Rock, Tx. 78664

Your 'outline' for needed materials is almost precisely the working outline Coop recently used to create the brand new STTI 'Home Terminal Handbook.' The history of the 'Handbook' might interest you. After the 1978 TV GUIDE article Coop penned on home terminals, and the subsequent coverage by the Cronkite CBS Evening News, more than 10,000 letters found their way to Cooper. After the first 100 letters, they all looked alike! Sitting down and pulling the questions out of each, an outline for the first 'Handbook' evolved. The most recent edition of the 'Handbook' is hot off the presses (STTI, P.O. Box G, Arcadia, Ok. 73007) for a very modest \$7.50 (USA). Now in a 'CSD type format' rather than the smaller 'back pocket' size it originated with, everything you ask and more is answered in up to date fashion in this best seller.

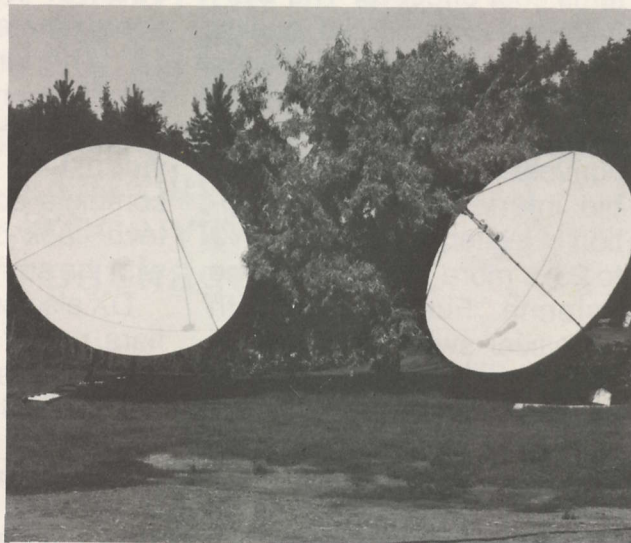
ALMOST ALONE

There are hardly any satellite receiving dishes here in my section of Manitoba. I first purchased Nelson Ethier's STT antenna handbook and using his plans built my dish antenna. I went to the states to purchase an Amplica 120 LNA, a Chaparral Super Feed and a Drake ESR-24. The price difference between the states and Canada on the LNA and receivers is outlandish; \$1,000 for the LNA and \$2000 for the receiver here! Not exactly competitive. With no prior experience, the 12 foot dish 'looking good,' I hooked up the electronics and turned it

on. **WOW!!!** There was a perfect picture from Westar IV, right when it turned on. After a few minutes of watching I moved the dish east and there was F4 with perfect pictures. We just could not stop watching; very exciting. Finally I got up the nerve to move to west and we went through and found all of the (strong) ANIK signals, and then finally F3R. Again, perfect pictures! The only satellite we don't get perfectly is the new Westar V bird; quite a few dots and sparklies in it. I liked the article in the September issue of CSD describing a position indicator for the antenna. I built one with a 5000 ohm pot and using a 'calibrated' ohmmeter in the house I know now where the dish is at all times. I had so much success with the dish that I then built a second one. Almost before it was finished it was sold. Now I am building some more antennas to sell. To purchase a 'commercially' built 12 footer up here costs upward of \$5800. This is unreal; everyone wants to retire early! I operate a grain farm and during the winter I will be building antennas. Finally I am wondering if anyone else is having problems with the **Satellite TV Guide** published in North Carolina. I sent them my money in August and have not heard a word.

David Somersall
Box 834
Souris, Manitoba
Canada

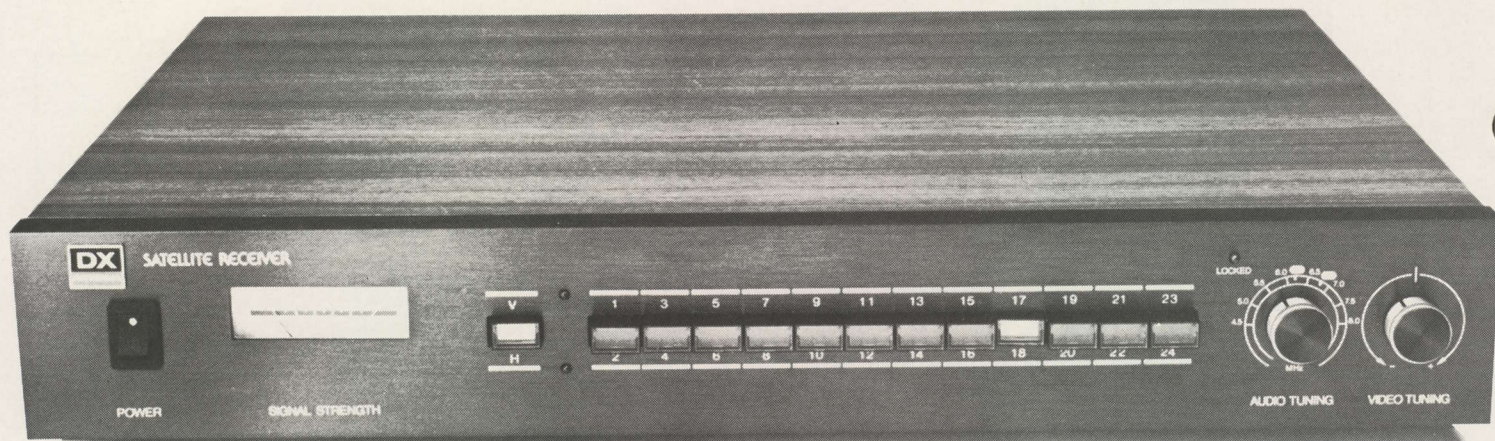
Perhaps 100 letters have come in through the two years since Nelson released his 10/12 foot do-it-yourself antenna manual. Many of those are from people who, like you, having built the first antenna soon find themselves in the antenna business. You may find that if the current wheat prices continue, building antennas is a better business than farming! David's first two antennas are shown here.

**TELE-TEXT?**

In CSD for September 1982, page 49, you write about a Sears Tele-Caption adapter for Tele-Text. Can this unit be used for the auxiliary services found on F3R, TR6 or TR18?

Ernest A. Bach
74920 Borrego Drive
Palm Desert, Ca. 92260

Sadly, no. The Sears Tele-Caption decoders are useful at the present time only on the PBS transmissions on W4. The Tele-Text experiments to date have failed to agree on a transmission 'standard' and thus we have CBS, PBS, et al each electing to create their own variation of the basic system. The Sears unit will work with PBS programs that are captioned plus it will work with some NBC and ABC programs. It will not work with any CBS programs. Nor will it work with any of the vertical interval signal services on WTBS. We suspect a clever electronic person could modify the Sears unit, which is widely available, to handle the WTBS (et al) services but to date nobody has come forward with a "here is how to modify" article or report for us. It is much needed.



Open New Doors in Multiple-Receiver Systems With the DX Receiver

Now DX Technology makes multiple-receiver mini-systems cost effective. The DSA 642 is a commercial quality satellite receiver that features dual, **block downconversion** through the DSA 541 down-converter. This makes possible interference-free reception in systems serving from 2 to 20 or more TV sets with one antenna. Furthermore with a coaxial switch it gives full 24-channel selection on each receiver.

The unit is housed in a handsome woodgrain-finish cabinet which measures approximately $2\frac{1}{2}'' \times 17'' \times 12''$. The large, easy to read signal strength meter, lockable audio tuning dial and video fine tuning dial give complete control and the "hi-tech" look blends attractively with the surrounding decor.

DX also provides line amplifiers, power dividers and other accessories compatible with the DSA 642 to complete the

system design.

DX, having pioneered the development of 12 GHz satellite reception, is one of the most respected names in satellite television reception systems in Japan and throughout the world. For more information, contact us today.

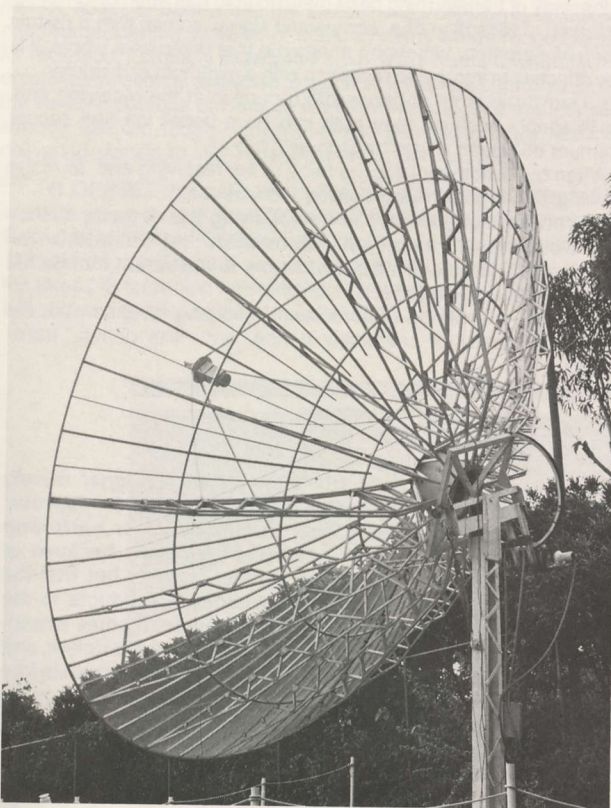
DX Marketing Group. C. Itoh & Co. (America) Inc., 270 Park Avenue, New York, NY 10017 (212) 953-5217. Manufactured by DX Antenna Co., Ltd., Kobe, Japan.



REALLY BIG/IN PUERTO RICO

Enclosed you will find several photographs of my 7.4 meter aperture parabolic antenna which I placed into operation last April in the City of Mayaguez. Reception is sparklie free on all F3R transponders. I am using an Earth Terminal/Washburn receiver, a 100 degree Ampli-ca LNA and I consider my pictures to be of excellent quality. This antenna is of my own design and construction. It is all aluminum, has more than 2,600 stainless steel screws, and the surface is a fine grid mesh. The ribs are made up from welded square tubing in a four petal pattern to offer ease of installation. The total weight for the antenna is 540 pounds, including the LNA structure. The Washburn down-converter is enclosed together with the LNA. A gear motor polar mount system provides excellent tracking for all of the satellites. At the moment we are arranging for mass production of a less sophisticated 16 foot model; our ACD-16. My background includes being retired as a Professor of Electrical Engineering at the University of Puerto Rico, Mayaguez campus.

Alipio Caban Domenech
Box 5257, College Station
Mayaguez, Puerto Rico 00708



Some project! There are bound to be many readers out there who would be interested in such a product for use in the Caribbean and throughout South America. As the product line matures, let us know more about the pricing and availability.

MICROWAVE AT WORK

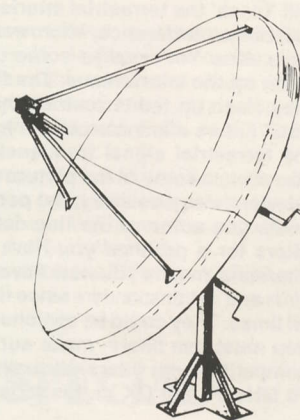
My first year with CSD has been an interesting and enjoyable learning experience. I found many articles instructional and many more entertaining; reading about the experiences in satellite TV from all over the world is very fascinating. I am planning to install my own TVRO very shortly, and I am concerned about a microwave tower located approximately one mile east/northeast of me. Can you tell me what the chances are that this tower will produce signals that will get into my LNA and cause me reception problems? Is this a hard, or expensive problem to solve? What would be the best way to find out if there are microwave signals here, at my selected site, before I install a

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John Watkins
Route 2, Box 166
Lawton, Ok. 73501

Not all microwave towers are bad. First, find out who owns and operates it. Contact them and ask them if there are any transmitting antennas/systems using that tower operating in the 3.7 to 4.2 GHz 'band.' If the answer is no, go about selecting your TVRO system without concern. If the answer is yes, then ask if that tower has any of the antennas pointing to the west/south-west (towards you). If the answer is no, go about selecting your terminal without concern. If the answer is yes, there are two next steps. Ideally, you would have someone with a trailer mounted TVRO antenna come to your location, set up, and then see if you have any signs of microwave interference. The interference will be possibly limited to a few channels, and probably limited to a single bird. 'Rural' Bell telephone sites seldom mess up more than four to six of the 24 transponders. Big city ones can be much more devastating because they carry more telephone 'traffic.' If your site is not a Bell site, you are virtually home free anyhow since others very seldom cause problems. With a trailer mounted antenna at the site, if there is interference, you can then try another nearby antenna location to see if putting a building or a tree or a ridge of some sort between you and the microwave site will 'block' the terrestrial interference. If all of this fails, and you still have interference, Microwave Filter Company of East Syracuse, New York makes some under \$100 filters which should clean up the interference. The filters are a last resort since while they clean up the terrestrial, they also cost you picture 'definition.' Filters eliminate certain frequencies which correspond to the terrestrial signal frequencies. The frequencies eliminated also contain some of the picture (video) information and while the interference goes away, the portion of the picture also removed costs you some of the fine definition of the picture. Installing filters for a problem you have on one bird, with a handful of channels, means you now have a loss of picture definition on all birds and all transponders since the filters usually stay in the line at all times. They could be switched in and out, but that's a hassle. If you must use filters, make sure you select a receiver which is compatible with filters. Virtually all of the receivers which have 70 MHz IFs are OK in this regard.

MEANINGFUL CONSUMER COMPARISON

I wish to thank you for pointing out (CSD, October, page 62) that meaningful consumer comparison of TVRO gear will continue to be difficult until some sort of uniform yardstick is available in the way of measurement standards. The question of occupied bandwidth of various transponders also deserves some comment.

For starters, let us note that in dealing with an FM signal, by definition, there is no amplitude variation (or information) at the time it is modulated. In theory, it has infinite bandwidth for any modulation, but as a practical matter the lack of envelope information is accurate for bandwidths at least as wide as Carson's Rule.

Now the interesting part. You cannot change the bandwidth of the signal without adding distortion, the amount of distortion being approximately equal to the portion of sideband power discarded! This is true so long as the recovering detector is a true FM detector. The reason is very straightforward, but probably beyond explanation to anyone who does not remember most of what they learned about vectors. In essence, the problem is this:

The FM modulation process **must**, to be distortionless, produce

sidebands in precise accordance with the Bessel Series; indeed it is this conformance that we use for the confirmation of modulation linearity in a lab Satellite Simulator.

If we prefilter the signal to a narrower bandwidth before transmission, **the filtering process in and of itself will add amplitude ripple to the signal.** Normally it would be desirable to again limit the signal and **refilter** before transmission to allow full power use of the transponder. This is because if we did not, and ran the transmitter at the full power level, the amplitude non-linearities of the transponder would cause **distortion products** (to be created) which might well lie **beyond the original bandwidth of the signal before filtering.** The process of limiting and refiltering the signal creates a signal that, on a steady state basis, could be considered to be **distortionless**; i.e. the envelope contains no information and is therefore 'pure FM.' If, however, one measures the resulting **recovered baseband output**, one finds that the apparent signal deviation is that of a signal that **could fit through the second filter cleanly anyhow.** The apparent deviation for large signals is **reduced** in this situation.

When taken in the context of overall video signal, **the result is non-linear gain, especially non-linear chroma gain**, as the chroma is preemphasized, and therefore incurs most of the distortion.

The point to all of this is that one should not assume that yet another way of transforming base metal to gold has been discovered! The 'ease' of reception of a 'compacted signal' comes with a certain burden of distortion, although I must note that taken as a whole, it is more effective to improving reception with a minimum of distortion... than a similar attempt at bandwidth reduction at the receiving end. This is simply because they both can do a better job and secure maximum utilization of the transponder power.

When bandwidth reduction is used at the receiving end, all of the incoming signal power lying outside the filter is:

- 1) Thrown away as "C" in establishing the detector CNR;
- 2) Converted to amplitude information that will add to the overall detector output distortion, to the extent that its AM rejection is imperfect.

Hopefully this will be of some use in helping folks sort out the overall importance of seemingly dense, and 'less dense,' transponders.

Clyde Washburn
Earth Terminals
P.O. Box 636
Fairport, NY 14450

Clyde's concern is that when a receiver designer merely begins 'chopping down' the bandwidth of a receiver to 'improve' the apparent picture quality, that the chopping or narrowing process not only throws away picture definition because of thrown away sideband energy (or 'Carrier Power'), but that the narrower bandwidths also add new distortion products to the picture. As we noted in October, there have been some experiments with narrowing up the modulation index at the uplink, and RCA has a patented system that interleaves a pair of signals into a single transponder, as well as an additional system that splits the transponder in half (similar to the Intelsat half transponder format) for simultaneous transmission of two video (plus audio) signals on a single transponder. Clyde suggests that, properly done, the narrowing done at the transmitter end is the more effective way to make the biggest improvement in system quality, but that would involve the cooperation and coordination of both the uplink folks and all of the associated downlinks. **Maybe we made a mistake adopting a 36 MHz wide transponder format in the first place!**

SPACE PLATFORMS may be coming sooner than we expected. Fairchild and NASA have put together a program that could launch relatively low orbit platforms as early as 1986. The platforms are to be self contained 'communities' in the sky with on board propulsion, communications and quarters for living and working. Under the concept, the platforms would be like space 'apartments'; and private firms and government agencies would go to Fairchild/NASA to lease space on the orbiting platforms to conduct experiments, process materials and so on.

OAK's ON-TV is scheduling a launch on **COMSTAR D4** for a pair

of channels of premium quality television, in partnership with Telstar Corporation of Los Angeles. OAK operates the ON-TV subscription television system in cities such as Los Angeles, and Telstar is involved with SMATV efforts to carry (via satellite) program packages to areas which cable has not yet reached. The 24 hour per day service will be scrambled using Orion technology (similar to ANIK CANCOM) and be addressable to individual receiving sites. Start-up date has not been announced, but Scientific Atlanta has already announced plans to retrofit existing SA antennas so they can receive both COMSTAR D4 at 128 west and F3R at 132 west with a single reflector surface.

TRANSPONDER WATCH

RECENT REPORTS OF ACTIVITY ON DOMESTIC / INTERNATIONAL SATELLITES

Send your reports to CSD Transponder Watch, P.O. Box 100858, Ft. Lauderdale, FL 33310. For late news, call (305) 771-0505.

CANADIAN authorities are on the 'scent' once again. This time they say they will crack down on any TVRO in Canada which is using reception of American or Canadian satellite signals for **financial gain**. Included in that broad statement will be apartments and condominiums using US or Canadian satellite signals for tenant quarters, motels, hotels or bars where the satellite programming is on display, and rebroadcasting systems or cable systems where money is paid for reception. Pointedly **exempted** are **private home terminals**. The enforcement effort is expected to result in numerous confrontations in the western portions of Canada where provincial governments have already told the federal government to stay away from terminals delivering signals to logging camps and other locations.

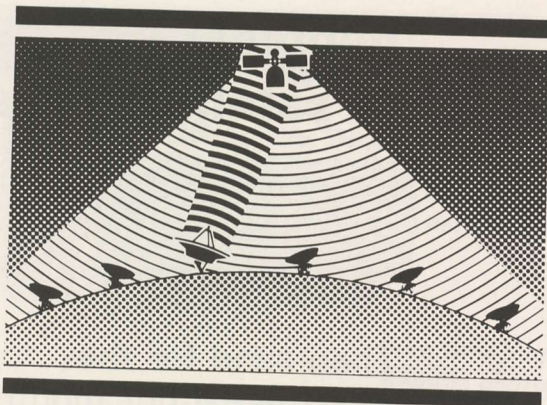
TO OFFSET the expected resistance from western Canadians who are using the US (and Canadian) signals without 'permission,' Canadian Minister of Communications Francis Fox has promised to 'hold hearings before the end of 1983' regarding a proposal to bring the three US television networks, plus the American PBS service, to rural Canadian areas via an existing ANIK satellite.

SATCOM 5, a bird dedicated to use for the ALASCOM (internal to Alaska) communications system has been launched and will take up duty station at 139 west. Internal to Alaska 'teaching television' may also end up on this satellite eventually, but not in the near term. The SATCOM 5 bird is **reported** to have a very tight antenna pattern designed to provide high EIRP coverage to Alaska, but very little to CONUS.

PATMAR TECHNOLOGIES, the national firm that is offering packaged motel/hotel delivery of The Movie Channel and other bird services, has moved to new, larger quarters with their Tulsa (OK) region office. Effective immediately Patmar's Larry James can be reached at Box D, 751 Christmas Lane, Claremore, Ok. 74017 (918-342-1955).

ARIANE now says they will attempt next launch in latter portion of February. This pushes launches for an additional Intelsat V birds into middle and latter portion of next year and will have other impact on North American domestic birds as well (i.e. Westar 6)

COMSAT plan for DBS and United Satellite TV's plan for DBS are



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Westar IV	TR5	Nov. 4	5-5:30 EST
Westar IV	TR5	Nov. 18	5-5:30 EST
Westar IV	TR5	Dec. 2	5-5:30 EST
Westar IV	TR5	Dec. 16	5-5:30 EST
Westar IV	TR5	Dec. 30	5-5:30 EST

Repeat Broadcast Schedule

Satcom	F3	TR18	Nov. 6	2-2:30 EST
Satcom	F3	TR18	Nov. 20	2-2:30 EST
Satcom	F3	TR18	Dec. 4	2-2:30 EST
Satcom	F3	TR18	Dec. 18	2-2:30 EST
Satcom	F3	TR18	Jan. 1	2-2:30 EST

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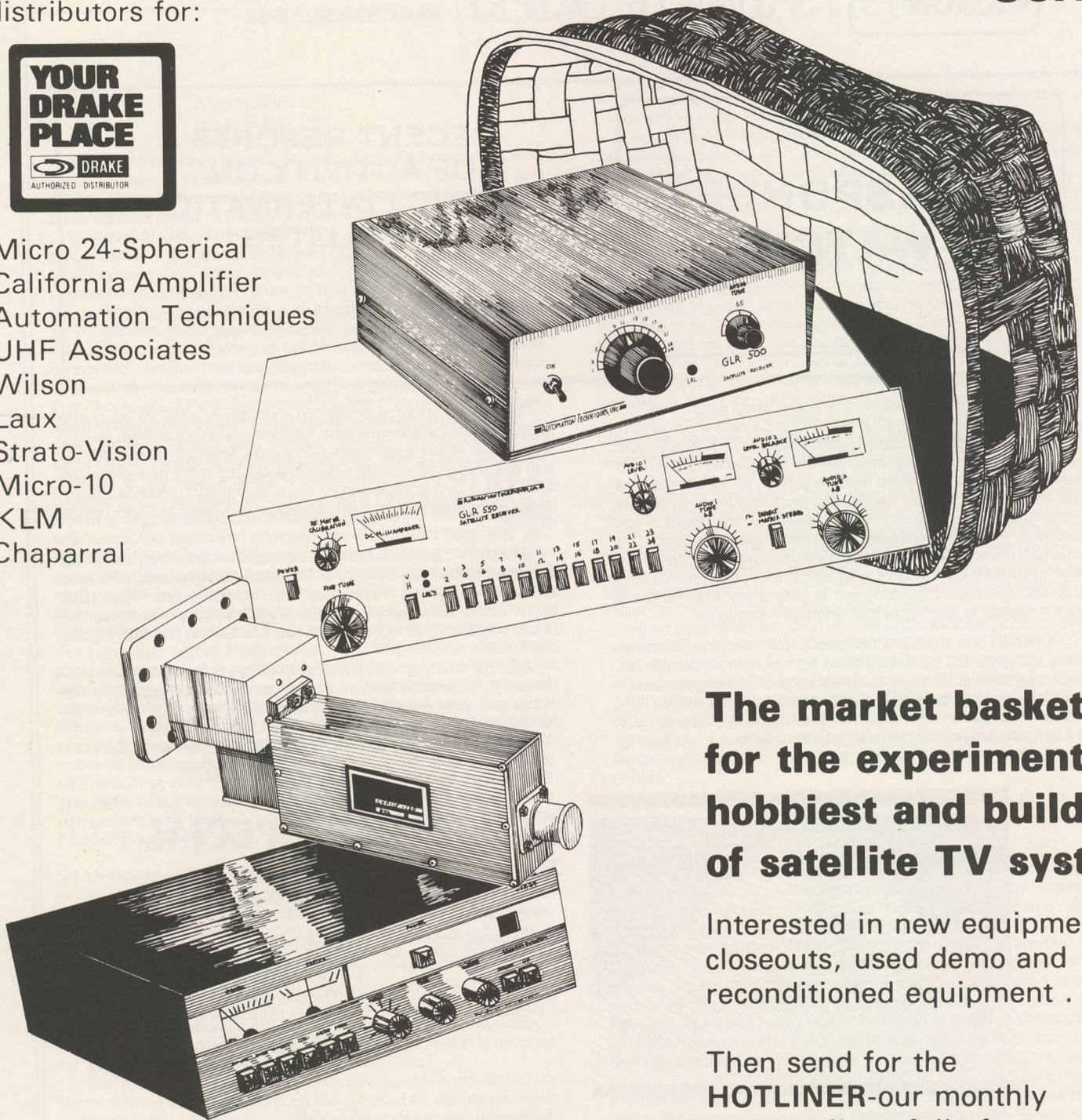
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battling in public and before FCC. **COMSAT** suggests USTV is attempting back door entry into 'low/medium' power DBS and claims USTV didn't give full effect of its plans to FCC when seeking advance approval. **USTV** claims COMSAT is merely trying to keep anyone from beating them into the skies with a DBS service. At stake is whether DBS will be here in 1983/84, or, not until 1986.

A MINNEAPOLIS federal court has ordered a private home owner who purchased his own MDS (microwave) receiving package to either pay the local MDS fee (\$19.95) per month, or, stop using service. MDS firm considers this a victory, estimates more than 20,000 'illegal' home systems are using their service in Minneapolis/St. Paul region. Others point out that combination of court decision plus MDS firm policy is really closer to victory for home viewers since no fines, back viewing fees, or MDS firm requirements that viewers **must use** MDS provided receive terminals will be enforced.

ALL of the facts are not in yet but there is enough data in to raise hopes of prospective TVRO installers in Ecuador. A test terminal

using a 'badly warped' 20 foot antenna, AVCOM receiver and 100 deree LNA near Quito is getting usable signals from F4, W4 plus biggest surprise of all; ANIK D (!). The Canadian bird signals on the test installation are the strongest of all tested to date. A 7.5 meter terminal is now going in, replacing the damaged 6 meter terminal, and from the next test series will come hard data on what North American services can be received, and used, in Ecuador.

WESTERN UNION has raised rates for video transponders, with approval of FCC. If user has signed agreement for a 'fixed use term,' he will now pay **\$172,500** per month for a fully protected transponder (i.e. if transponder fails, WU will find a replacement transponder of equal quality, even if somebody of a lower class has to be bumped); **\$96,000** for a non-protected transponder (i.e. if your transponder fails, you are out of luck, but someone with a protected transponder that fails cannot cause you to be bumped); and, **\$75,900** for a preemptible transponder (i.e. you could get bumped if somebody with a protected transponder loses their transponder).

LOOK for major move of all Alaskan services on RCA SATCOM F2 (119 west) to SATCOM F5 (143 west) during late December and early January. SATCOM F5 launched into orbit late in October and will begin testing from 143 west as you read this. RCA Alascom will operate 16 of the 24 transponders on board F5 providing telephone, television and data communications largely within Alaska. F2 is likely to be little used (as is F1 relatively lightly loaded at 135 west) and its orbit location will be assumed by a new Southern Pacific Communications satellite.

HAMS may have their first geostationary satellite for North America; a newly proposed bird for CableSat General includes an amateur transponder that would receive amateur uplink signals in (allocated) 5.6 GHz amateur band and downlink signals in (amateur allocated) 3.4 GHz band. Several major hurdles are ahead, including revisiting of international amateur regulations which presently preclude some amateur satellite operations from a geostationary satellite operating in these ham bands.

INTELSAT is not very happy . . . with the people at Eutelsat. The Europeans (Eutelsat) have announced that they intend to build and

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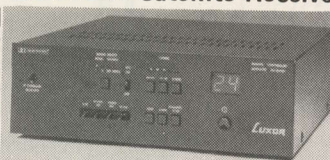
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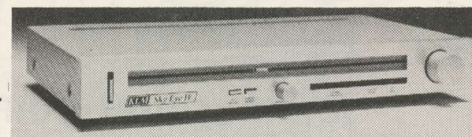
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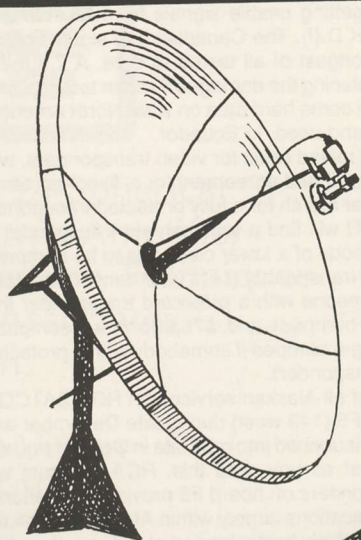
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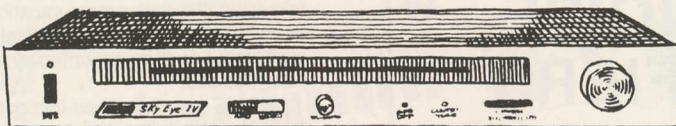
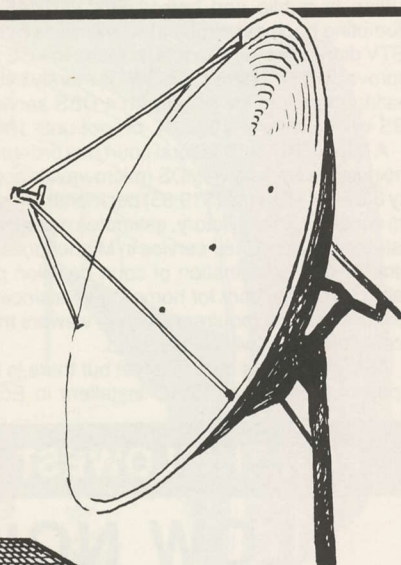
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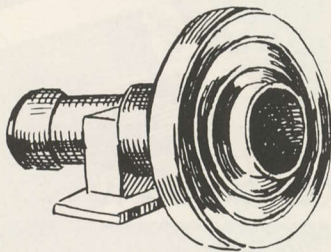
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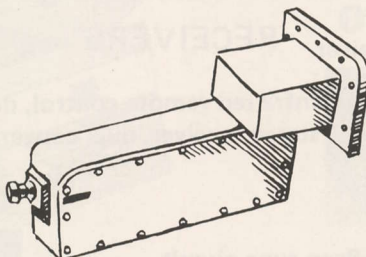
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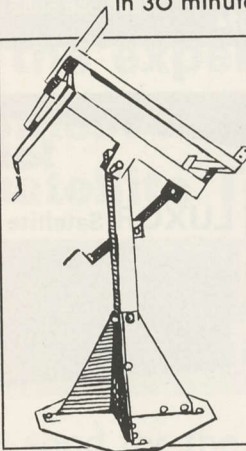
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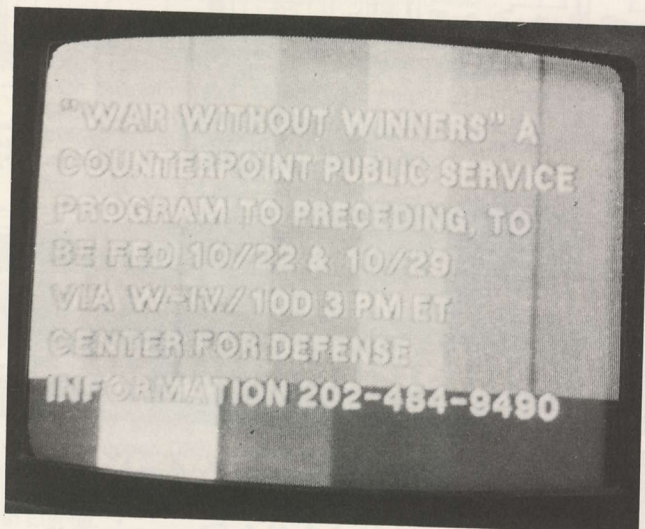
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operate their own satellites to exchange television, radio, telephone and data traffic between countries within Europe. This is contrary to the INTELSAT agreements each member nation has signed. The European countries suggest that they will give INTELSAT another five years of exclusive control of communications, **but**, no longer.

DISNEY will be on WESTAR V afterall, having agreed to lease a



pair of V transponders through Robert Wold. Confusion was apparent when Group W split off from 50-50 operation of Disney Channel, and Group W transponders were to have been used for delivery of service. Disney will begin operations in mid-April of 1983 with an east and west coast feed.

OAK INDUSTRIES has decided **not** to be in the early-rush 12 GHz

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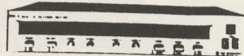
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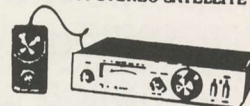
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DBS business afterall. OAK had planned to lease channel space on the mid-83 operational ANIK C 12 GHz bird and to concentrate on MATV type installations in northeastern quadrant of USA. Several reasons were given for decision not to rush out of the DBS starting gate; most of them boiled down to the financial gamble being more and more risky every month. OAK still plans to launch their own DBS bird in 1986.

NATIONAL CABLE TELEVISION ASSOCIATION head Tom Wheeler has tried every way to get his home into the 21st century. First he tried to have MDS installed, but could not get a signal. Then he tried STV and also found he could not get a signal. Finally he attempted to have a home terminal installed, but once again found tall trees blocked his view. Some people will **never** get the message!

EFFORTS to create some technical (equipment) standards for the industry are underway. At the late October STTI trade show in Atlanta, a new technical steering committee from SPACE met to discuss how best to organize the effort. Many manufacturers, most distributors and dealers applaud the effort recognizing that without reference standards for equipment in the industry, there can be no 'clean way' for consumers to feel comfortable with the TVRO purchases.

ANTENNA Technology Corporation (3448 S. Highland Drive, Las Vegas, Nv 89109) has announced a new Simulsat 7 'multiple beam antenna' capable of accessing as many as 20 satellite locations simultaneously. Each satellite has a separate feed and LNA(s) and its own downline, sharing a common 'unusually shaped' reflector surface. The unit is attractive to broadcasters and some cable systems, but is not likely to compete with motor driven systems for the home market, at \$45,000 each.

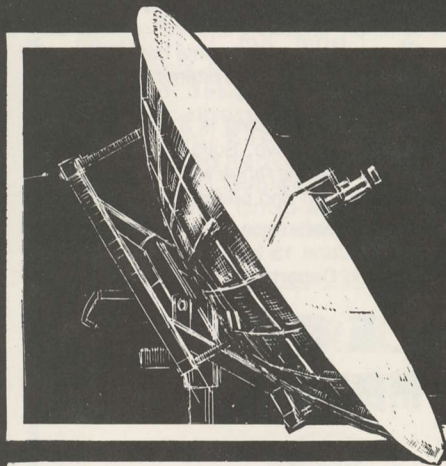
ANTENNA test range performance testing is a new service at Telesat Corporation (6515 Corporate Drive, Suite D, Houston, Tx. 77036). The firm has a 4 GHz antenna test range which it 'hires out' to antenna manufacturers, providing gain and pattern measurements.

CANADA will hold first satellite conference, dealing with domestic and international satellite trends, June 15 to 17 (1983). Meeting is partially sponsored by Telesat and Department of Communications; details 613/231-2288.

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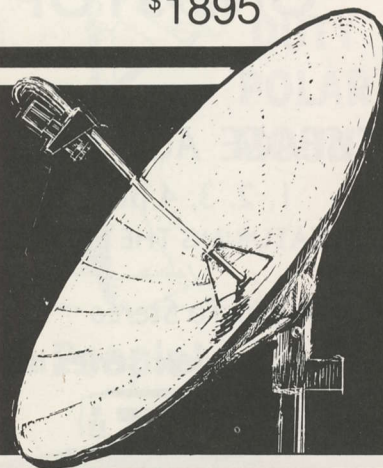


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LOOK FOR additional announcements from SPACE after their 'victory' in negotiating an agreement for SMATV (SPACE) members to use the Westar 4 SelectTV service for motels and hotels; and, the near parallel agreement that allows **all** SPACE members to use the F3R C-SPAN service. SPACE is close to additional agreements for services such as ESPN, and perhaps one of the independent stations. PATMAR Technologies, meanwhile, has added WGN/United Video to its stable of licensed services for motels and hotels.

MEXICAN satellite system will be constructed by Hughes, after close bid war with RCA. System will consist of two satellites, aims for July 1985 operational date, and will have 24 operating transponders on each bird with both C (4 GHz) and Ku (12 GHz) transponders.

SHUTTLE was scheduled to launch ANIK C-1 and SBS-3 (both 12 GHz birds) in mid-November. This was to be first use of Shuttle for actual launch of satellite packages. There is a certain amount of risk involved in being 'first' and Telesat (ANIK) and SBS are getting special 'introductory' price of just over \$8,000,000 each for the service.

CHINA has announced dates for planned launch of first domestic, Chinese, 4 GHz satellites. The first bird will launch in the first quarter of 1984, and be stationed at 70 degrees east. A second bird will launch later in 1984 and be positioned at 125 east. The exact transponder parameters are unknown although China reports that terminals as small as 5 meters (16 feet) in size will be used for the huge television receiving network being planned.

EUROPEAN satellite enthusiasts are exchanging new rumors almost daily. Among those recently floated; that CBS is planning to create European CBS network service, to be delivered via satellite, first to European cable TV systems. Or, at least one European satellite located at 34 west or so will carry programming created for US market, in Europe.

FOLLOWING on heels of Hughes announcement of special feed configuration allowing cable firms to use a single reflector for **two** satellites, 4 degrees apart, Prodelin part of M/A COM has announced special feed for antennas in five meter (and up) size range which will produce reception from **three** satellites; the main-bird plus two on either side, offset by the 'standard' 4 degrees.

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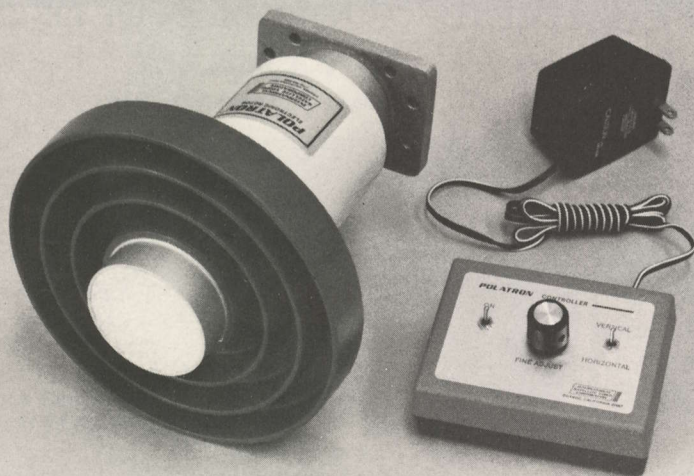
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JAPAN now plans to introduce DBS in the latter half of 1984 with a new BS-2A satellite launch. The bird will have both 12 GHz and 20 GHz capabilities. A second satellite will launch as a standby in 1985. Power output will be 100 watts per transponder, and spare 100 watt TWTs will be wired up on board. Initially, only two channels of (NHK) television are planned.

BACKYARD terminals are getting new attention from local (municipal) governments and a number of towns and cities are considering or acting upon 'ordinances' which seek to restrict the installation and/or size of terminals. SPACE has responded by starting work on a 'model' TVRO Ordinance which it will supply to municipal entities seeking to adopt regulation in this area.

AUDIO programming on subcarriers on F3R will grow dramatically, according to a recent study of cable television system needs. The

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latest to announce is a 24 hour jazz music network to be carried on a CBN (TR8) sub-carrier. The addition of each new sub-carrier to an existing video plus program audio sub-carrier package causes the downlink transponder to drop by between .5 and .75 dB at all receive locations. Small home terminals installed with very little or no margin on important transponders may find the additional subs will bring their sparklie level up dramatically. The answer is to be prepared with a slightly larger-than-required dish, and a better grade of LNA (i.e. lower noise temp) than is absolutely required for present day service levels.

NOT LIKELY in 1982, but look for FCC to act upon their own petition to reduce orbital spacings from 4 degrees to 2 degrees, early in 1983. Issue is important one since many of the 11 foot and under antennas now in use or sold may have a difficult time handling satellite to satellite spacings as tight as **2 degrees**. Various studies performed disagree on how tightening up the orbit belt will affect small terminals, although most studies agree that moving from 4 degree spacing to 3 degree spacing will have only a marginal impact on reception quality for dishes 9 feet and larger in size.

IN something less than total friendly action, NCTA has voted to allow SMATV operators to join trade association. There is a catch, however. SMATV members may not vote or hold office and are not officially recognized as 'cable TV operators.'

MEANWHILE, the National Satellite Cable Association, largely made up of cable operators and former cable operators who are now into the SMATV business, plans to hold its first 'convention' January 24 and 25 in Dallas, Texas. The gathering will include seminar sessions, exhibits and concentrate on addressable technology. Information from NSCA at 713/342-9655.

LINE UP of nations planning to attend important 1983 western hemisphere meeting, where DBS and other satellite orbit spots will be decided for perhaps twenty years into future, is getting intense. More than half of the countries that are eligible to participate have already filed 'claims' on specific orbit spots. The conference will seek to sort out competing claims, especially at 12 GHz where DBS competition will be considerable. Among the more amusing requests or filings to date: Cuba wants six channels from 107 west; Bermuda wants four

from 95 west; British Virgin Islands is asking for four channels from 92 west; Cayman Islands wants four channels from 111 west, and, the tiny French enclave of St. Pierre off the coast of Canada wants four channels, all of its own.

BERMUDA has been granted permission by INTELSAT to take direct US network feeds from US domestic satellites for use by either of two Bermudian terrestrial television stations.

YEARS AGO a much younger NASA attempted to bounce radio and television signals off of material released from a sounding rocket launched from Wallops Island in Virginia. The tests worked, but barely. The latest attack on this technique is called 'Space Mirror' and it involves 'floating' a small mirror made up of fine metallic mesh several hundred miles above earth. At least one commercial firm believes this technique will provide 'low cost' relay of communications, including television. So far there have been no buyers of the system which goes for around \$1,000,000 'in orbit.'

WOLD has announced the transponders which will be put into use by Disney on WESTAR V. Both are vertical, 10 and 12 on your conventional dial but polarization swapped from conventional SATCOM series birds.

OLD and tired transponders on combo flight of COMSTAR D1 and D2 at 95 west are now available for just \$95,000 per month (full time use), through at least the summer of 1983. There were 12 transponders set aside by RCA/Comstar on D1-D2 birds when RCA was trying to keep cable programmers happy prior to flight of F4. These same transponders will now be available in increments of one month each. Details from 212/334-5555.

YOUR local Catholic church may be in the market for a TVRO. Take a look at Westar 4, transponder 6 (vertical) Monday through Friday from 1230 to 330 ET. New Catholic Telecommunications Network plans expanded service beyond initial three hours per weekday, there, soon.

SENATOR Goldwater, an electronics enthusiast and devotee to TVROs, recently told Senate Commerce Committee that he expects to see a "decline in cable within next two years as well as in traditional terrestrial (network) TV. One day soon, I expect to see little dish

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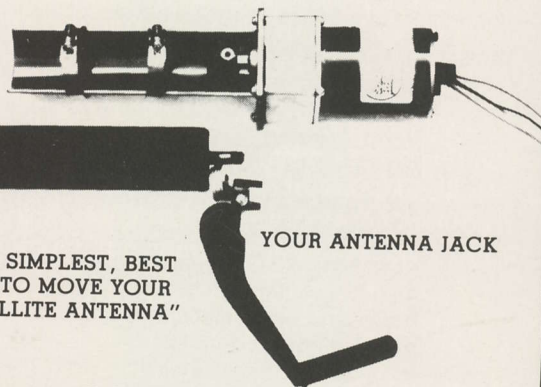


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antennas selling for around \$200 on the roof of every home . . ."

COOP / Continued from page 3

sexual, so openly displayed, in so many European countries. But there is a bright side to this typical American puritanical reaction as well; 'sex' is probably as close as the world can come to a 'universal' language and 'sex films' probably would carry themselves very well all over Europe (even in France!) even if the spoken words were not understood by the viewers. The first guy that puts up a 'Sex Channel' in Europe will probably do more to create a market for TVROs than anything else that could be launched. More important, perhaps, a heavily sex programmed channel would bring back the youth of Germany and other countries who largely today ignore television broadcasts.

I believe the most important thing to keep in mind about the opening of the European marketplace, at least from the observations of my first, short, inspection trip, is that unlike America where there are 'national attitudes' that tend to homogenize the people of Maine and the people of Oregon, each European country has its own traditions and needs which will require at least at the outset individual attention to what the local population most needs from satellite service. I don't think you can develop a 'continental' marketing plan that will universally fit more than two countries at a time.

Right behind 'sex,' news comes closest to having a universal appeal. However, unlike 'sex' which is surprisingly unregulated even in the marketplace, news touches on the very 'national foundations' of each country. I am not sure how many of the countries would allow even CNN2 'in' without a fight. Newscasts are national in scope in all countries except England, where 'regional' inserts are included in the national reports. That means every viewer is told the same thing at the same time. 'Told' is a key word here since news is overtly, or subtly, controlled by some all powerful national agency in virtually every case.

I will not pretend that I could follow closely a German newscast well enough to understand the subtle twists and meanings built into the reports. But I do know that when I discussed the day's news events with locals who spoke English, their perception of events often differed from my own markedly. I trace that to the way the reports are presented to them on the 'tely.'

Which brings us to the next phase of TVRO growth in Europe. News will sell, but it will sell first in countries such as Holland, Switzerland, and Belgium where there is already such an 'overwash' of neighboring countries that one more voice won't provoke the individual governments. The UK will come on line quickly here since they seem to have far less of a news censorship program in force.

I feel that it will take somebody like Ted Turner (or more specifically, it will take 'the' Ted Turner) to figure out the right way to first fly an Americanized television service, via satellite, into Europe and the surrounding areas. My inclination at this point is to suggest that a combination of CNN plus WTBS be packaged into a feed for Intelsat, that it be aggressively pre-sold to cable firms in Switzerland, Belgium, Holland, Finland, Gibraltar and Malta for a start. There could be 500,000 homes hooked up at turn on in those countries alone, which is probably not enough to offset the Intelsat transponder bill. But there are things happening in England right now which will make it a very large market for such an 'Americanized' program package before 1983 is out. Let me explain.

When I was in the UK, everyone I talked with was buzzing about the expected release of something called 'The Hunt Report.' This was a long awaited study done under the direction of one Lord Hunt; a proposed 'game plan' allowing England to aggressively pursue both cable TV and DBS/satellite TV in the coming decade. When I was in London, nobody knew whether Lord Hunt was going to come out 'for' or 'agin' the twin concepts of expanding television delivery services in the UK.

The shoe was dropped and Lord Hunt and his staff have clearly come out in favor of an almost totally deregulated (I hesitate to say

CONTINUED / page 75

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COOP / Continued from page 72

unregulated) approach to allowing cable TV and DBS to get started in the UK. In a country where the government has fiercely resisted virtually every effort to expand viewer choice of television programs, this report has the effect of suddenly releasing a flood gate at a dam. The onrush of excitement is difficult to describe.

The next step in the UK will be the adoption of specific legislation, in Parliament. Lord Hunt is speaking on behalf of the existing, ruling, conservative party and his recommendations fit the recent conservative approach to allowing more and more competition in the previously state-run monopolies. Telephone communications, for example, is being re-arranged as well.

England already has a modest CATV/MATV industry. Perhaps ten percent of the homes receive their television via one or the other. But, CATV as we know it is virtually unknown. That 10% number is put into perspective when you realize that a not insignificant number of those cable connected sets are actually not TV receivers at all, but rather input-switched baseband (video and audio) 'monitors' or displays, cable or wire connected to a local distribution center.

The English invented 'cable TV' and 'cable radio.' A firm called ReDiffusion has, since the 30's, made a decent living renting out audio amplifiers and speakers, wiring up whole neighborhoods with audio lines which are fed with one or a handful of 'radio channels' from a central office. They began doing the same thing with television when the BBC launched the first television service from Crystal Palace in the latter part of the 30's. Most of us would not call this 'cable TV' but the fact is that the single BBC television channel was being 'cabled about' more than 12 years before the first American 'cable TV' system got operational. Another Englishman, Leslie Farey, was building cable TV systems as we know them today in the UK in 1938. Farey subsequently went to work for a number of Canadian and US cable TV equipment manufacturing (50's and 60's) and today resides in California.

In spite of this early start, British telecommunications dictated that UK cable systems could **not** import non-British programs, could not even jump about the countryside for non-local BBC and ITV transmitter signal sources. Cable has been called 'Communal Aerial' (systems) for two decades in England. We would call them MATV systems, and by our standards, they are hardly modern. The UK recently began a very small, carefully controlled, closely monitored experiment for a pay TV service carried by cable. Movies, similar to our own premium service channels, are run. Too few homes have the optional service available for any kind of meaningful marketing pattern, or success/failure ratio, to develop however.

Lord Hunt's program would grant 8 year 'franchises' for cable, force cable systems to carry the local BBC/ITV services (similar to the US rules that force cable firms to also carry their local signals). Lord Hunt recommends that cable firms be allowed 'maximum freedom' to select program sources from wherever they wish. Lord Hunt may have been addressing the marketing of a 'sex channel' when he suggested that cable firms be mandated to follow "the same decency standards" as current BBC/ITV program channels, "except on those channels available only on a (premium) pay basis. . .".

There are more than 22,000,000 TV homes in the UK. Not an insignificant market. Those already attached to a piece of cable may be the first to get new, additional, services. Before that can happen, most of the existing systems will have to be re-built from the ground up to reflect modern, broadband, cable technology. **That phase** of expansion should begin almost immediately.

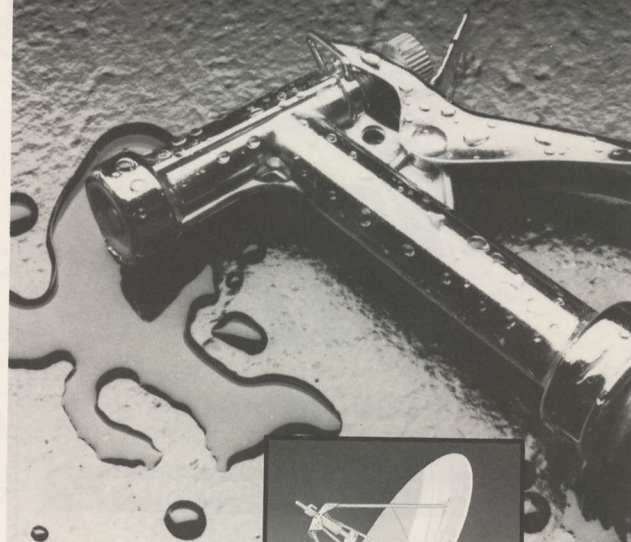
In Germany a similar 'approval' of cable is caught up in German politics. Two, rather massive, 'trial/test systems' have been approved. They are preceding but the present German government may not endure and the near term status of **that** program is uncertain.

Then there is the recent action by **Eutelsat**. That's the consortium of European nations which is putting together the first multi-national effort to design, launch and operate a sizeable number of 12 GHz birds for most of western Europe. Eutelsat started a ruckus recently by announcing that it wanted to get out of the Intelsat agreement which binds each Intelsat member nation to a provision in the Intelsat rules preventing nations from supporting and using satellite delivery systems **not run by** Intelsat. The bottom line here is that the European members of Intelsat, calling themselves Eutelsat, feel the American

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25% ownership in Intelsat is another clever American ploy to dictate to Europe how and when Europeans can use the international satellite system for what purposes. Intelsat is clearly upset over this announcement. Eutelsat equally clearly sees regional 'domsat' birds operating for the exchange of television, radio, telephone and data communications within Europe. Intelsat views this development as a challenge to Intelsat sovereignty in international telecommunications. I suspect there is some concern among European members of Intelsat that the 25% Intelsat owners, Comsat, seems 'free' to play around in **North America** with its own DBS/non-Intelsat birds while the European members are told that 'no, you cannot operate outside of Intelsat.'

Recognizing that the combined weight of their European voices cannot change Intelsat policy from within, the Eutelsat members are proceeding to attempt either a change or an end run from without. This battle may take a few years to resolve but in the meantime the handwriting is clearly on the wall; Europe **will have** inter-national exchange of television (and other) communications, on satellite, and soon. The only real question is which agency will provide it.

Now, since it is apparent that Europe as a body is not going to wait any longer to join the satellite revolution, and it is also apparent that 50 to 70 year traditions of state run, state-monopolized telecommunications systems are about to tumble, what does all of this portend for the selling of TVRO hardware in Europe?

Getting a reasonable new selection of programming sources into the air is only part of the problem. Even that is unclear since most of Europe is keying up for 12 GHz delivery systems, to the exclusion of our traditional 4 GHz systems. I suspect that ongoing negotiations by Ted Turner, with potential European markets (cable), for some mixture of his present services are having a tough time focusing on which delivery system to use. Ted **could** lease space on Intelsat **tomorrow** and put some sort of service into Europe on 4 GHz. It would cost him more than \$2.5M a year for a transponder, and because of the present configuration of Intelsat beams, even 20 foot dishes would be marginal for **quality** cable service delivery. On the other hand, he could go to Europe on 4 GHz (still costing him \$2.5M a year or so), and then **re-link** throughout Europe on 12 GHz. Unfortunately, **today**, the only 12 GHz connection is the largely experimental OTS bird which the English STS group is using to pump around 3 hours of movies and American drama into they claim more than 500,000 cable homes nightly. The OTS experiment will end sometime in 1983, and then arrangements on another 12 GHz bird will be required. Double hopping (to Europe on 4 GHz, throughout Europe on 12 GHz) will cost roughly twice as much as simply trying to deliver on 4 directly. Given that economic fact, there could be a decent argument made for simply staying on 4 GHz for now, and buying 4 GHz 'monster terminals' for cable firms that want to carry the service. You can buy a bunch of 24-30' terminals for \$2.5M.

Things are clearer, today, on the **home terminal** front. Europe, today, is just about where I was in 1976 when I decided to start gathering the bits and pieces for my pioneer home TVRO back in Arcadia, Oklahoma. I had to have a 20 foot dish (I thought) to get decent pictures, in 1976/77. So too do you need a twenty foot dish for decent reception in Europe, Africa, and the Middle East. I had around 8 to 10 channels of service available way back then. So too, today, do you have perhaps a dozen channels of service available. As Bob Behar points out in this issue (his **South African** experience), and as Steve Birkill relates in his new STTI '**International Handbook**,' there is far more regular programming on Intelsat today than most of us suspected. I judge there to be more than sufficient programming to launch a decent private terminal business in the three continent area.

Which brings us to the next element; the hardware, and its installation.

As Bob Behar and others are finding, you **can** haul a twenty foot terminal into most African countries, install it, and walk away for about \$40,000. True, some of these are going into countries such as Cameroon where prior to satellite TV there was 'no TV.' Obviously a person who had nothing before you got there is going to be more quickly satisfied than someone who had a local reference to compare with. But even when there is a local 'comparison standard,' you have to remember that the local standard is operated by a state run agency, news is 'manipulated' if not outright censored, and coverage is often inadequate if there at all. Entertainment can best be described as

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Randy Thomas (left) Manager of
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Ted Treider, TREIDER ELECTRIC & SUPPLY

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"The head engineer of the cable company came out while we were setting up our demo model. He had seen several other competitive models. He thought, dollar for dollar, Winegard's was more satellite for the money."
**David Thomas, MELODY MUSIC MAGNAVOX HOME ENTERTAINMENT CENTER
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"We were able to use an ordinary pick-up truck to take it to the site. . . The reception is really good. Every time we look at it we get a good, clear picture."
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The performance has been real good. I'm sold on Winegard. They've got a good product. One customer was concerned about the mounting. Last week we had a 70-mile-an-hour wind — it knocked down trees and everything else. The dish turned, but outside of that it didn't get hurt one bit."
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'light.' If a twenty foot terminal will provide upwards of a dozen (Intel-sat) feeds to virtually all of Africa, the Middle East and Europe (and it will), there is **already** plenty of programming selection available to sustain the sale of terminals to wealthy individuals, to hotels and casinos, and resorts. This is **not** the \$2995 installed North American marketplace; yet. It is the same marketplace which we had in the USA and Canada in 1979 or 1980. Only it is far bigger.

The hardware we have. The expertise we do not have. As several people have pointed out to me, gaining the knowledge necessary to crate, prepare export papers for, and ship satellite hardware from the USA to any of these areas is going to be a painful learning period. You don't just call UPS or the local freight line and hand them a box destined to Ethiopia. In some cases, only determined by trying and failing, you won't ship a satellite terminal into country 'X' under any circumstances. I would guess that a terminal inbound to France would never get past French customs. Not if they knew what it really was!

All of this sort of comes together during 1983. I am reminded that we had almost exactly the same fears, concerns and lack of knowledge when we first gathered in Oklahoma City in August of 1979 for the first STTI Seminar. There was no real industry prior to the first SPTS (seminar). It took that seminar, bringing together 500 plus people who wanted to create an industry, to get things rolling.

I therefore view the forthcoming **CAST '83** (International Cable and Satellite Television Exhibition and Conference), in Birmingham, England with the same purpose as the first SPTS, with great excitement. This conference, scheduled for September 11 to 14 in the National Exhibition Centre, potentially may be 'the launch pad' for the private and cable connected and hotel (et al) connected TVRO industries in a three continent area.

Would not a similar approach operate in Europe (et al)? There is reason to believe it would. But putting it altogether, being mindful of the basic business and lifestyle differences that exist between North America, and, the balance of the world, is going to be no easy task. The forthcoming CAST '83 show in Birmingham, England would appear, on the surface, to be well timed and well situated to handle the launch of the private TVRO industry in Europe. **Unfortunately**, the CAST '83 backers have absolutely no background in communications, and a very short time to learn what **space** telecommunications is all about. The recently released Hunt Report which opens the door for cable television in England is a mixed blessing. It tells us that cable, fed via satellite, in England (and one presumes in other European countries as well) will now take off and amount to something. But the England location of CAST '83, plus **their** excitement about cable per se (as opposed to satellites plus cable) points at CAST '83 being so broadly based (cable plus satellites plus other forms of telecommunications) that satellites will get shuffled into a minor role position relative to cable.

The emphasis must, I believe, be on the satellite system since without a viable international satellite programming delivery service industry, all of the cable in the world cannot survive. It has been the growth of satellite services, and satellite programming in particular, which has provided the fuel for the growth of private plus cable terminals in North America. If we still had today, as we had in the summer of 1977, **only** CBN plus HBO plus WTBS (WTCG) available as program services, our growth would never have occurred.

This leads me to believe that it will take North American technology, **handled by North American entrepreneurs**, to bring this off. We know, because we have learned the hard way, what works and does not work. We have made the mistakes and we have been able to overcome those mistakes and build an aggressive, growing industry.

My plan is to take a small group of technology leaders from the US and Canada, and 'tour' Europe during the late spring and summer. We would hold two day cram-course seminars in locations such as Germany, Switzerland, Belgium and England to teach potential users of this technology just how it all works, and what can (and cannot) be done with the technology.

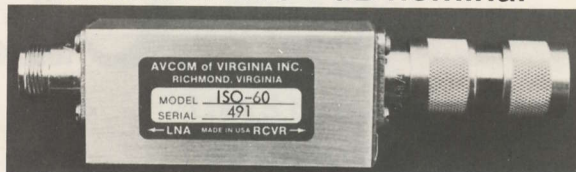
Then, assuming that attendance is good and response is favorable, a major all-industry effort (perhaps through SPACE) could be put together to stage a major technology show plus seminar in Europe in the fall. Having spent the spring and early summer speaking to groups of 20 to 50 people throughout Europe, we will then know what the real interest level is, and what types of problems Europeans, Africans and

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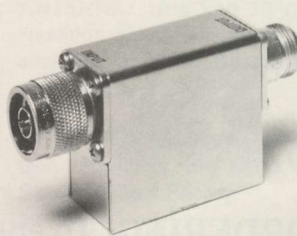
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those from the Middle Eastern sub-continent envision in getting this service 'off the ground.'

Getting our technology into Europe is my major time, pet project right now. I will be pleased to share my thoughts on how this should be done with others who have similar plans, and perhaps an ad hoc committee of North American technologists from our field can tackle this challenge as a group to bring off the next growth phase of our industry.



CAST 83's Martin Ashenden, 'his' Sue, and Coop in the foyer of The White House Hotel in London.

If the European market along with the nearby (North) African and Middle Eastern markets **do look** like they may be bursting at the seams by the latter portion of 1983, what and how must the US marketplace react to become a part of this activity? Certainly as a group we have found that 'trade shows' (STTI, SPACE) have been excellent vehicles for putting our technology into the hands of thousands of people. And once that technology has been transferred, we know that the entrepreneurial spirit then takes over.

BIRKILL'S FIRST BOOK

I know that some of you will find this incredible, but until recently **Stephen J. Birkill** had never written a book. Not all at once, anyhow. At the just completed Atlanta STTI show Rick Schneringer brought out the first 'Birkill' book. **We** had promised it about two years ago, as I recall. Nobody was more relieved than I to see it finally roll off the presses.

The history of Steve Birkill in this industry has been the history of the industry itself; except that Birkill has always lead the rest of us by from a half year to several years. I guess it would not be unfair for me to report that Steve has finally decided, after a September trip to the states, to stay in England for awhile and concentrate on getting a new satellite distributorship and manufacturing company off the ground. I have met and talked with others involved in this venture with Steve, and I feel quite good about their chances for success. I mention this up front since there are many out there on 'our side' of the Atlantic who continue to be concerned about Birkill having the proper opportunity to really contribute to the industry. I think that perhaps fate stepped in and kept him in the UK afterall, for **now** he is very carefully poised to

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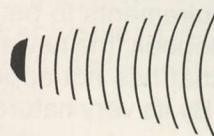
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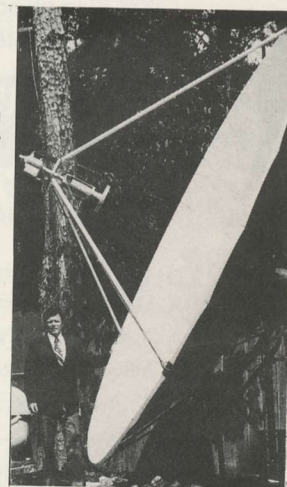
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lead the development of TVROs in Europe, and possibly Africa and the Middle East.

The new Birkill book deals with international satellites. Not the odd-ball US or Canadian bird that has wandering footprints into the Caribbean or northern South America, but those which are clearly intended to transmit in a hemispheric or global pattern to large chunks of the earth below. Here in North America, most of us have never seen such a satellite's transmissions, and many of us have no particular desire to 'tap into' a feed from ABC Beirut to ABC New York, via Intelsat, since often we see it anyhow on a Westar bird making the final leg of the journey from Maine to NYC.

But as Bob Behar (yes, he's back again!) points out in this issue, when you are installing a twenty foot terminal in **South Africa**, or in some other not-served-by-domestic bird location, the Intelsat feeds suddenly take on new significance.

The new Birkill book, available exclusively through STTI, is someplace between spectacular and mind blowing. I have been privy to much of what I read there, in the odd bits and pieces from Steve, through the years. Therefore I, unlike most readers, could not be expected to exclaim 'WOW!' and 'FANTASTIC' with each new revelation as I turned the pages in eager anticipation of more exciting data. Without shame I must admit that I started reading an early proof copy at 12 midnight one morning early in October while trying to wind down from 12 hours of paste up for the November **CSD**. I thought to myself, "I'll just read a few pages and then go to sleep." Two hours later, after reading and re-reading, I found I couldn't sleep. Seeing all of that impossible to find data, neatly, clearly and succinctly laid out before me was more than I could take.

I am convinced that 1983 will be the year that home, private TVROs go headlong into the European and African and Middle Eastern market. I know of one supplier who is now building, under contract, some 40 terminals of 20 foot size for delivery to a single Middle Eastern distributor. My telephone calls and letters from people working on or planning terminals for Morocco, Spain, Germany, Italy and where have you have multiplied ten fold in the last sixty days. And finally, as noted earlier in this month's comments, there is the first-ever 'European TVRO Show' scheduled for this coming September.

It all comes together, in 1983, and Birkill is on the money with an extremely readable, extremely well researched book which I urge everyone to order without wasting even a moment. Between the basic Birkill data in the new 'International Handbook' and the monthly reports that we fully expect to see mushroom in **CSD** during 1983, anyone who is not getting in on the 'action' in Europe (et al) will be missing the opportunity of a lifetime.

SERIOUS EQUIPMENT EVALUATION

After attending the just-over Atlanta STTI trade show, and hearing from dozens of people who feel that "something MUST be done" to alert or notify dealers when equipment is being peddled which does not function well, or reliably, I have put my head together with immediate past President Tom Humphries of SPACE.

Evaluating equipment, for performance, durability, and price/value, is a tough assignment. I read with amusement other recent attempts to do this and see sentences and entire paragraphs in print that were lazily lifted directly from the manufacturer's product brochures. I have had little room to talk, however, since my 'evaluations' have lacked a **structured** form.

I began evaluating equipment several years ago. I have done it in a free-flowing style, noting in print the things that impressed me because they worked well, and those that bothered me because they did not. But my evaluations have been 'narrative' rather than procedural and that is, I judge, a shortcoming of my approach.

I can appreciate the plight of the manufacturer who elects to send something down to us for evaluation. If he is a receiver manufacturer, he **knows** I am going to use Washburn and AVCOM receivers as a comparison standard and since both of these units are high dollar end units it is probably not fair to do that to a much lower priced unit. LNA manufacturers have stayed away from me since they can sell all they want on their own, and the chance that I might get a bad unit could do some damage to their sales. We got into it with Dexcel about a year ago and Art Kawai has never forgiven me! We do have in house, unbeknownst to the manufacturer, a new-brand of LNA which has an 80 degree **claimed** noise temperature. It will take us a couple of



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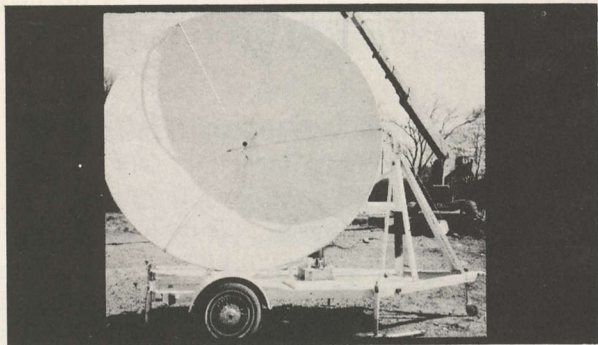
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months to properly check this out and I'll address how we intend to modify our testing program shortly.

Antenna manufacturers have been frustrated by the distance to the Turks and Caicos islands. I finally worked out a water transportation mode and antenna manufacturers now deliver their product to a Fort Lauderdale freight agency and we handle the antenna from that point onward. Accessory items, such as modulators, sub-carrier tuners and the like get carried down here in briefcases or packed with the underwear.

With Humphries now a fulltime resident of Provo, I saw the opportunity to enlist his aid with the evaluation program. He is, after all, one of the most talented TVRO field engineers in the world today. He has had a hand in antenna design projects, LNA design projects and receiver design projects. He has forgotten more than most of us, me included, will ever know about equipment performance evaluation.

And, frankly, there is something unhealthy about the editor of a magazine creating not only the editorial copy but the sales oriented evaluation copy, plus, on occasion courting advertising support from manufacturers. I assure you that most manufacturers always attempt to tie a review of their products to 'advertising support.' I've lost a lot of advertising by not caving in on that one. It would be far better, however, to have somebody **else** responsible for the equipment evaluation. Someone who has nothing whatsoever to do with the regular editorial material, and who could care less if anybody ever advertises.

Finally, there is the matter of no structure for equipment evaluations. RL Drake or Janeil have no concept of what to expect in the way of an evaluation since we had no solid outline of testing procedures which we followed. That has been a mistake on my part.

So during the Atlanta STTI show Tom Humphries talked with a number of equipment manufacturers about the problems associated with equipment evaluations, and the creating of an editorial review. Tom and the OEM's he talked with came to a number of mutual understandings. There is now a structured outline of what we ("we" really means Tom, here) will look for, and measure, and describe in our future evaluations. Tom prepared a 'check list' of specific measurements and tests for antennas and LNAs and receivers. He is working on similar check lists for accessory products. Any manufacturer who wants to participate in the testing and editorial review program can contact Carol Graba for a copy of the testing check list. In that way the manufacturer knows precisely what tests will be performed. If that still fails to satisfy them, Tom can discuss the precise testing procedures with them on the telephone.

Some readers have suggested that when a manufacturer supplies a piece of equipment to CSD for test, we always get good units. That sounds reasonable; who, after all, would knowingly send out a 'lemon' for product review? The same readers suggest that we really ought to be obtaining product in the marketplace, quietly and without fanfare, and then 'surprising' the manufacturer with a review. That is not as unholy as it may sound. But it is not the complete answer since we **do need** to communicate directly with the manufacturer to fully understand his design philosophy and his assembly approach. We want to do far more than a mere 'Consumer Report' evaluation. We prefer to describe **every** parameter of a product, including why certain things are done in a certain way, to increase the reader's understanding of products.

LNAs are notoriously suspect since they are 'graded' anyhow. What is to stop a manufacturer from shipping us a unit marked 120 which is actually a hand picked 80, for example? Naturally we would report that this firm had a heck of a 120 unit!

Antennas are less suspect since any overt surface and structural inaccuracies are easy to spot, and measure, and diagnose. The bottom line is that you can't fool an experienced antenna engineer like Humphries (Howard, etc.) by shipping a 'super hot' antenna for evaluation.

Receivers are another story. I am told that as many as 50% of some of the newer models fail to operate, or operate very poorly, when they pop out of the box. That tells me that QC (quality control) is lousy at the plant. Us getting one that does work, and writing about it, does not 'protect' the innocent dealer who reads our frank review from receiving two that do not work; out of an order for two. Humphries has an answer to this problem. I can't really disclose what it is because as soon as I do, there would be those who would immediately start

scheming to circumvent the Humphries 'check system.' Suffice to say that when required, we will test at least **two** of a product and only one of them will come directly from the manufacturer.

This issue of **CSD** carries several letters dealing with hardware integrity. Nobody knows better than I that there are problems with hardware in the industry. Nobody understands better than I the frustration a new dealer feels when he buys a 'bill of goods' with his meager resources and then discovers the equipment is sub-standard, and he has a bad hassle getting it fixed or replaced. I believe I have the largest 'pile' of sub-standard equipment in the world, downstairs in the store room here on Provo. And some of it dates back to 1977 and before!

KUDOS TO BROWN

I want to congratulate SPACE's **Rick Brown** for breaking down the 'iron curtain.' That congratulations extends to **Fred Finn** and the rest of the staff at SPACE who have now made it possible for TVRO installers to offer, through SPACE, legal reception of C-SPAN and SelecTV to motels and hotels and apartments and others. Sadly, the SelecTV part does not yet include private homes, but I think it is coming.

There is bound to be some confusion over the SPACE 'victory' and I want to straighten it out here. In the October **CSD** we interviewed Larry James of PATMAR Technologies. James revealed that through his company, an installer can offer **The Movie Channel** to motels and hotels. It might appear to some that this is the same as SPACE working out a licensing arrangement with SelecTV. It is not.

SPACE negotiated a contract with **SelecTV** (on W4, TR18) on behalf of every SPACE dealer/SMATV member. That means that if you belong to SPACE, and you better belong to SPACE(!), through SPACE you can 'access' SelecTV and then go to a motel or a hotel and offer SelecTV for a fee. The present SelecTV schedule is about 8 hours or so per weekday, longer on weekends. They have announced expansion to 24 hours per day but that start up date has not been released.

PATMAR Technologies negotiated a similar deal with The Movie Channel. To access the Warner service (F3R, TR5) you need to be an affiliate of PATMAR. Some are viewing the two approvals as being competitive (overlooking the present 24 hour service status of The Movie Channel). In a sense they are, but neither is exclusive. You can, as a dealer, offer (through PATMAR); either The Movie Channel, or, (through SPACE) SelecTV (plus C-SPAN). Or, with twin dishes you could offer both services to an upbeat installation.

The SPACE effort is on behalf of the entire industry. We all fund SPACE, and we all win when SPACE wins. The PATMAR effort was first, and it is private. Financially, you may come out better with PATMAR but that remains to be seen. For your long term growth, however, the future success of SPACE in similar efforts may have more 'insurance value' to you.

What I see happening is people 'taking sides' in this; deciding whether they are a PATMAR 'man' or a 'SPACE' man. Hey, that's dumb and it misses the main point. Down the road in 1983 PATMAR may well also be offering SelecTV. And SPACE may also be offering The Movie Channel. A third and fourth to-be-born pair of firms may be offering HBO or ESPN or CNN. At some future point there may be a dozen service packages about, each offering a slightly different mixture.

Long term, SPACE may well have no need to be in the 'middleman business.' Today, because it takes the clout of our entire industry to get the first agreement like this opened up, SPACE needs to be there doing exactly what they did; getting us some service, a decent service, which we can then turn around and sell in the marketplace.

Brown and Finn and group fought long and hard for this one. This **one**, single action may well be the most important positive action to occur within the industry during calendar year 1982. I suspect we will look back on this five years from now and tag this with being a 'turning point' for the industry. Brown and crew deserve your personal thanks and congratulations for a job well done.

HELLO MARIO YEPES

Through the years I have been involved in this industry I have met and made hundreds of friends from outside the USA and Canada. This is, afterall, an 'international' industry. **Mario Yepes Gomez** is one of

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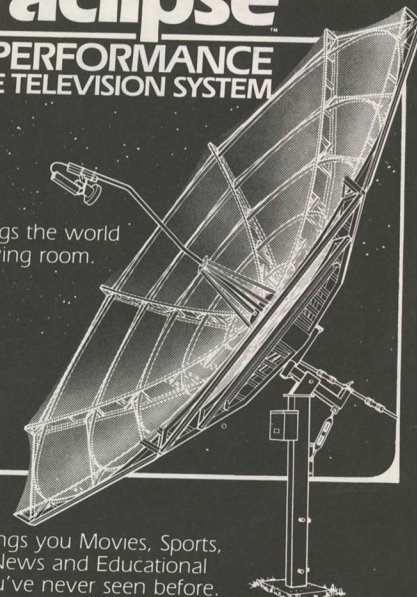
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those.

Mario lives near Medellin in north central Colombia. Mario has been building huge antennas since late in 1979, trying to pull in decent service from some of the American satellites. This past spring Mario finished his latest 11 meter monster, and at about the same time along came the much higher signal levels in his area from at least the hot vertical transponder set on F3R and the vertical set on W4.

Mario has also been battling with the Colombian national government to obtain a license to provide satellite delivered television to people in his area. He wanted to put in a cable system but got turned down. Then he wanted to put in a low power transmitter. And they turned him down on that one also. Mario does not give up easily.

Having been turned down officially, Mario set about constructing a local station on his own. Following, I suspect, some of the guidelines worked out by the Coopers here in the Turks and Caicos (see CSD for November 1982) Mario turned on his transmitter and for three weeks the residents of Medellin were treated to WGN and other US programming. Then the Colombian government made him an offer he could not refuse. And the transmitter was turned off. Again, Mario does not give up easily.

His next attack was to take his case to both the people, and, to the Colombian court system. He has mounted a legal attack on the government's monopoly over television broadcasting (they operate the local networks and there are no local stations, only 'national networks'). The main thrust of his court challenge is that the government monopoly is a violation of Colombian 'free speech' constitutional provisions, and, a violation of the (international) Universal Declaration of Human Rights.

When the government tried to point out in court that **they** could not authorize Mario to rebroadcast **US** satellite programs, Mario countered by pointing out that the geostationary orbit belt passes directly over Colombia, and that his country needs no one's permission to access programs that 'originate' in 'Colombian air space.'

Mario Yepes Gomez has tackled a lot of legal questions all at one time. He may well lose because the size of his first bit is larger than he can chew and digest. But Mario cannot be faulted for trying, and he certainly has come a long ways since he turned up at the first SPTS event(s) to study our technology, and take it home with him to Colombia. We all wish you well Amigo!

PROVO RETREAT/Now History

Playing to something less than a sell out crowd, the first 'Provo Satellite Retreat' is now history. Those who took a week out of their busy lives to spend it in the sun and sand with Humphries and I on the Island of Providenciales will, I hope, consider their time well spent and the direct expense worthwhile.

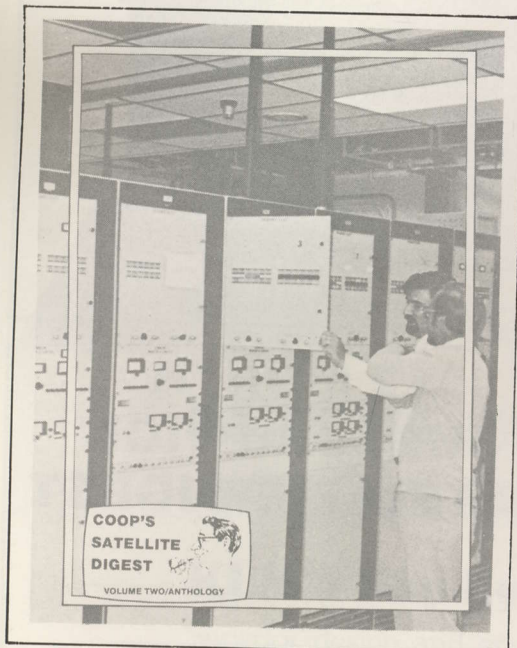
Because the group was small (we'll cover it in some detail since there was a great deal of new technology shared there; in the January CSD) we quickly became an informal family. I put everyone to work leading one to quip that he never had so much fun in all his life, paying someone else to allow him to work for them for a week! During the course of the week, everyone had the opportunity to run TV cameras at WIV, hook up and operate point to point microwave, take apart and put back together antennas, test receivers, explore Intelsat feeds, and really get into the hidden world of teletype and special data circuit feeds on both domestic and international satellites.

There was a brief period, which I shared only with Tom Humphries, when I **thought** that Arthur C. Clarke might join us on Provo for a few days. Clarke, you will recall, was scheduled to appear on the NBC **TODAY** program November 15th, and I thought I detected a couple of days 'hole' in between his **TODAY** appearance and his next scheduled stop in Los Angeles later that week. I did not reckon with the duties his US publisher had arranged for him while he was in the states to promote his latest book, **2010: Space Odyssey II**, and those duties got in the way of our capturing Clarke for a few days of fun in the sun. Perhaps next year.

Several on hand suggested that we re-name the Provo 'Retreat' the '**Satellite Summit Meeting**.' I can honestly say that most of us on hand got more out of those five working and playing days than any of us had anticipated. It was, most of all, a great deal of fun and the fact that we shared a lot of hard to get information and learned so much in the process, was a purely coincidental sidelight.

Sorry you missed it, but there will always be 1983.

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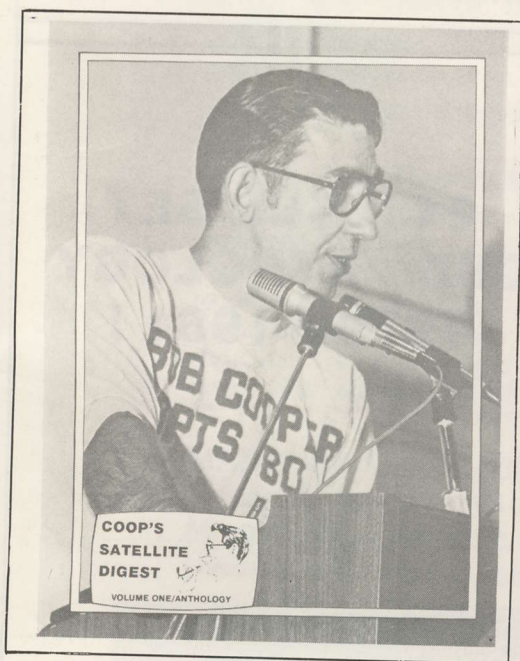
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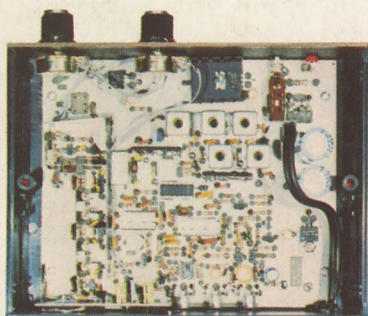
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